# G. PULLA REDDY ENGINEERING COLLEGE (Autonomous): KURNOOL Accredited by NBA of AICTE and NAAC of UGC An ISO 9001:2008 Certified Institution Affiliated to JNTUA, Anantapuramu



# **Scheme – 2017**

Scheme and Syllabus for III, IV, V, VI, VII & VIII Semesters of Four year B.Tech. Degree Course in **CSE** 

Department of Computer Science and Engineering G. Pulla Reddy Engineering College (Autonomous): Kurnool Accredited by NBA of AICTE and NAAC of UGC Affiliated to JNTUA, Anantapuramu.

# Vision and Mission of the Department:

## Vision :

The department aims to become a leader in the field of education, training and research in Computer Science and Engineering.

# Mission :

**Mission 1:** The department strengthens the core competence in computer Science and Engineering by imparting quality education and training.

**Mission 2:** To promote innovation and research through collaborative and participatory approaches.

**Mission 3:** To inculcate the leadership capabilities, ethical values and professional behavior to face the challenges in global market.

# Program Educational Objectives(PEOs)

Program Educational Objectives(PEOs) of the under graduate programme in Computer Science and Engineering at G.Pulla Reddy Engineering College (Autonomous), Kurnool are to prepare the graduates to possess the ability to

**PEO1:** Analyze, Design and Develop computer based systems and applications using core areas of Computer Science & Engineering.

**PEO2:** Be engineering professionals, innovators, entrepreneurs engaged in their profession with social awareness and ethical values.

**PEO3:** Work in teams in multi-disciplinary areas to address the needs of society.

# Program Specific Outcomes(PSOs) :

**PSO1** : Understand the principles, structure and development methodologies of system software

**PSO2** : Design, develop, implement and test application software for systems including distributed software systems.

**PSO3** : Understand the architecture and organization of computer systems, embedded systems and networked systems.

### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

**CSE–III Semester** 

**Scheme: 2017** 

S No	Course		Credits	I pe	Scheme nstructi eriods/w	of on eek	Scho N	Scheme of Examination Maximum Marks			
5.110	No.	Course Title	Creans	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks		
Ι		Theory									
1.	HU201	Managerial Economics and Financial Accountancy	3	3	0	0	60	40	100		
2.	CS201	Discrete Mathematics	3	3	0	0	60	40	100		
3.	CS202	Switching Theory and Logic Design	3	3	0	0	60	40	100		
4.	CS203	Advanced Data Structures	3	3	0	0	60	40	100		
5.	CS205	Database Management Systems	3	3	0	0	60	40	100		
6.	CS207	Computer Organization & Architecture	3	3	0	0	60	40	100		
7.	ML01	Constitution of India	-	2	-	-	-	-	-		
Π		Practical									
8.	CS204	Advanced Data Structures Lab	1	-	-	2	50	50	100		
9.	CS206	Data Base Management Lab	1	-	-	2	50	50	100		
10.	HU203	203 Advanced Communication Skills Lab		-	-	2	-	100	100		
		Total		20	0	06	460	440	900		

### FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

CSE – IV Semester

Scheme: 2017

S No	Course		Credita	Scheme of Instruction periods/weekScheme of Exam Maximum M			me of Examina aximum Marks	tion s	
5. 110	No.	Course Title	Creuits	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Mark s
Ι		Theory							
1.	BS204	Probability & Statistics	3	3	0	0	60	40	100
2.	CS208	Object Oriented Programming	3	3	0	0	60	40	100
3.	CS210	Operating System	3	3	0	0	60	40	100
4.	CS211	Computer Networks	3	3	0	0	60	40	100
5.	CS212	Design & Analysis of Algorithms	3	3	0	0	60	40	100
6.	CS213	Software Engineering	3	3	0	0	60	40	100
7.	ML02	Environmental Studies	-	2	-	-	-	-	-
II		Practical							
8.	EC212	Basic Electronics Lab	1	-	-	2	50	50	100
9.	CS209	Object Oriented Programming Lab	1	-	-	2	50	50	100
10.	HU204	Soft Skills Lab	1	-	-	2	-	100	100
		Total	21	20	0	06	460	440	900

# MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTACY (MEFA)

III Semester: C	Common for CS	E and	<b>ECE</b>				S	cheme: 2017			
Course Code	Category	Hou	irs/We	ek	Credits	Ma	ximum Marks	1			
HU201	Foundation	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
		3	0	-	3	40	60	100			
Sessional Exam	<b>Duration: 2</b> Hr	'S					End Exam Du	uration: 3 Hrs			
Course Outeem	At the and a	fthad	0.011#2.0	atudan	ta will be ab	la ta					
CO1: Understar	id the nature and	scope	e of ma	nageri	al economic	s and various c	oncepts of dema	and analysis			
CO2: Understar	nd the significant	ce of o	demano	d elast	icity and dif	ferent concepts	s of demand for	ecasting			
CO3: Understand the concepts of production and cost analysis and different market structures and their competitive situations											
<b>CO4:</b> Understand the concept and significance of capital budgeting											
CO5: Understar	<b>CO5:</b> Understand the principles and significance of accountancy and preparation of final accounts										
	enderstand die principies and significance of accountancy and preparation of mail accounts										
				U	NIT– I						
Introduction to A Managerial Eco Determinants, La	Managerial Econ nomics- Definiti aw of Demand ar	nomic on, N nd its	cs & D ature a except	<i>emana</i> nd Sco ions, L	e: ope; Demand aw of Dimi	d -Meaning, Ty nishing Margin	pes of Demand al Utility, Indif	, Demand ference curve.			
				UN	II – TI						
Elasticity of Der	mand and Dema	nd Fo	orecast	ing:							
Elasticity of Den	nand-Types, Me	asure	ment a	nd Sig	nificance;	of Domond Eo					
Demana foreca	sting – Importanc	e, Fa	ctors, f	urpos	es, methods	of Demand Fo	recasting				
			13.	UN	IT–III						
Theory of produ Production And Returns to Scale Cost Analysis Analysis – Its In Market Structur – Monopolistic Monopoly.	<ul> <li>Theory of production &amp; cost analysis and Market Structures:</li> <li>Production Analysis: Meaning, Isoquants &amp;Isocosts, The law of diminishing Marginal Returns, Law of Returns to Scale, Internal and External Economies of scale.</li> <li>Cost Analysis – Cost concepts, Cost output relationship for Short Run and Long Run, Break Even Analysis – Its Importance, Limitations and Managerial uses</li> <li>Market Structures: Types and Features of different market structures–Perfect Competition – Monopoly</li> <li>– Monopolistic and Oligopolistic; Price output determination in case of perfect competition and Managerial</li> </ul>										
				UN	IT–IV						
Capital and Cap Introduction: s decision to inve rate of return me	<i>Capital and Capital Budgeting:</i> <i>Introduction:</i> significance of capital budgeting, steps in capital budgeting, optimum level of capital, decision to invest under certainty-payback period method, net discounted present value method, internal rate of return method, sources of capital, decision to invest under risk and uncertainty										
				UN	NIT-V						
<i>Introduction to Financial Accountancy:</i> <i>Principles of Accountancy:</i> Introduction, Double Entry System of Book Keeping-, Journal, Ledger, Preparation of Trial balance <i>Preparation of Final Accounts:</i> Trading Account, Profit & Loss Account, and Balance Sheet with adjustments, Final Accounts problems.											

1. A.R. Aryasri, Managerial Economics and Financial Analysis, McGrawHill Education

### **Reference Books :**

1) Varshiney and Maheswari, Managerial Economics, Sultan Chand & Co, New Delhi

2) Vanita Agarwal, Managerial Economics, Pearson Education

3) Domnick Salvatore: Managerial Economics in a Global Economy, 4th Edition, Thomson

4) S.P.Jain and K.L.Narang, Financial Accounting

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam

# **DISCRETE MATHEMATICS (DM)**

III Semester : CSE Scheme: 2017										
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS201	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	Core	3	0	-	3	40	60	100		
Sessional Ex	am Duration: 2	Hrs				End E	xam Duration:	3 Hrs		
	A1 1	0.1		. 1		11.				
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to		1.0		
equiv	alence and implic	ations	repres 5.	sentati	on of statem	ients using coni	nectives, norma	Iorms,		
CO2: Calcu permu	late numbers of p tations and comb	ossib inatic	le outcons.	omes	of elementa	ry combinatoria	al processes suc	h as		
CO3: Solve gener	homogenous and ating functions.	Inho	mogen	eous r	ecurrence re	lations using su	ubstitution meth	od and		
CO4: Under and bi	<b>CO4:</b> Understand the concept of planar graphs, Hamiltonian graphs, Euler graphs, spanning trees and binary trees.									
CO5: Under Algori	<b>CO5:</b> Understand the association between the elements of sets using digraphs and Warshall's Algorithm.									
UNIT– I										
Mathematical I Statements & N Other connectiv Normal forms Inference for st	Mathematical LogicStatements & Notation, Connectives, Well Formed Formulas, Equivalence & implications, Duality law, Other connectives.Normal formsNormal forms- Principle Disjunctive Normal form, Principle conjunctive Normal form, Theory of									
	atement calculus.			UNI	T_ II					
Elementary Co	mbinatorics			0111						
Permutations & Combinations v	Combinations, vith repetition, Pr	Enu1 incipl	nerati e of In	on of clusion	Combinat n-Exclusion	ions and Perm	utations without	repetition,		
				UNI	Γ– III					
<i>Recurrence Re</i> Generating Fun Relations, Solv Characteristic	<i>lations</i> actions of Sequen- ving Recurrence F Roots, Solutions	ces, C Relatio of Inh	alculat ons by omoge	ting Co Substi eneous	Defficients o tution and C Recurrence	of Generating F Generating Fund Relations.	unctions, Recur ctions, The met	rence hod of		
				UNI	Γ– IV					
<i>Graphs</i> Basic Concepts search and Bro Graphs, Euler's	Basic Concepts, Isomorphism and Sub graphs, Trees and Their Properties, Spanning Tress-Depth First search and Breadth First search, Minimal Spanning Trees, Binary Trees, Planar and Non planar Graphs, Euler's Formula, Hamiltonian Graphs, Chromatic Numbers.									
				UNI	$\overline{\mathbf{T}} - \mathbf{V}$					
Relations and Introduction, P Special elemen Warshall's algo	<b>Relations and Digraphs</b> Introduction, Properties of Binary Relations, Equivalence Relations, Digraphs, Partially ordered sets, Special elements of POSET, Hasse Diagram, Lattices and their properties, Transitive Closure, Warshall's algorithm.									

- Trembly.J.P and manohar.R [2011], Discrete mathematical structures with applications to 1. computer science, Mc-Graw-Hill International Editions.
- Joe L.Mott, Abraham Kandel and Theodore P.Baker [2008], [2nd Edition], Discrete Mathematics 2. for Computer Scientists and Mathematicians, PHI.

## **Reference Books :**

- 1.
- Dr. S.Chandrasekharaiah, Mathematical foundations of computer science, -Prism books Pvt.Ltd. Ralph P.Grimaldi [2006], [5th Edition], Discrete and Combinational Mathematics-An Applied Introduction, Pearson Education. 2.
- Liu [2004], Elements of discrete mathematics, McGraw-Hill. 3.

### **Question Paper Pattern:**

# Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# **End Exam**

# SWITCHING THEORY AND LOGIC DESIGN (STLD)

III Semester:	CSE						Sche	me: 2017		
_	Category	Hou	rs/We	ek	Credits	Ma	aximum Marks			
CS202	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	Core	3	0	-	3	40	60	100		
Sessional Exar	n Duration: 2 H	rs		•		End	Exam Duratio	n: 3 Hrs		
~ ~ ~										
Course Outcon	mes: At the end o	f the	course	studer	ts will be a	ble to	1			
col: Understa	nding number co	nvers	ions, E	rror de	etection and	correction med	chanisms: parity	,		
CO2: Apply th canonica	e Axioms and the ll forms.	orem	s of Bo	olean	Algebra for	minimization o	of Boolean func	tions,		
CO3: Apply th chart to	<b>CO3:</b> Apply the minimization procedures using Karnaugh map, Tabulation method, prime implication chart to obtain minimal SOP and POS.									
CO4: Design of	combinational cir	cuits:	Encod	ers, D	ecoders, Mu	ltiplexers, RO	M, PLA.			
CO5: Design Sequential circuits using Flip-flops and sequential logic.										
CO6: Design F Johnson	Registers: Shift R Counter.	egiste	r, Bi d	irectio	nal Shift Re	egister and cour	ters: Ring Cour	nter,		
				TINI						
		1	T1 1		$\frac{1}{1}$		· 1 NT 1			
Number Syster	<b>m &amp; Binary C</b>	odes: nnlen	The I	Jecima Binary	al, Binary, Arithmetic	Octal, Hexad	Weighted Bin	r System,		
Non Weighted	Binary codes. Er	ror De	etectin	g Code	es. Error Co	rrecting Codes	Parity Checkir	ary coucs,		
Boolean Algeb	ra & Minimizati	on of	Boole	an Fu	<i>nctions:</i> Ba	sic Definitions	, Axiomatic De	finition of		
Boolean Algeb	ra, Basic Theore	ms an	d Prop	oerties	of Boolean	Algebra, Bool	ean Functions,	Canonical		
and Standard F	orms, Other Logi	с Оре	eration	s, Digi	tal Logic ga	ates.				
				UNI	T– II					
Simplification Product of Sum Don't Care C of Prime Implic	of Boolean Func as Simplification, Conditions, The cants.	<i>tions:</i> NAN Tabu	The M D and lation	lap Mor NOR Meth	ethod, Two, Implementa od, Detern	Three, Four, F ations, Other two nination of Pr	ive and Six vari to Level Implen rime Implicants	able maps, nentations, , Selection		
Combinedious	Transa Turtura dar	-4:	Deri		<u>[- ]]]</u>	1.1	terre Celle Ce	· · · ·		
Analysis Proc Equivalence Fu	edure, Multileve inctions.	el NA	AND	Circui	ts, Multilev	vel NOR Circ	cuits, Exclusiv	e-or and		
Comparator, D (PLA).	ecoders, Multip	olexei	rs, Rea	ad On	ly Memory	(ROM), Prog	grammable Lo	gic Array		
UNIT-IV										
Sequential Log Circuits, State Counters, Desig	<b>fic:</b> Introduction, Reduction and A gn with State Equ	Flip l ssigni ation	Flops, nent, I s.	Trigge Flip Fl	ering of Flip op Excitatio	o Flops, Analys on Tables, Desi	is of Clocked S ign Procedure, 1	equential Design of		
				UNI	T-V					
<b>Registers:</b> Introduction, Registers - Registers with parallel load, Sequential Logic Implementation, Shift Registers - Serial Transfer, Bi-directional Shift Register with parallel load, Serial Addition. <b>Counters :</b> Ripple Counters - Binary Ripple Counter, BCD Ripple Counter, Synchronous Counters - Binary Counter, Binary Up-Down Counter, Johnson Counter.										

I

1. M.Morris Mano, Digital Logic and Computer Design, Pearson Education, IV Edition, 2011

### **Reference Books :**

- 1. ZviKohavi [2008], Switching and Finite Automata Theory, TMH.
- 2. F.J.Hill and G.R.Peterson [1981], [3rd Edition], Introduction to switching theory and logic Design.
- 3. Donald D. Givone [2006], [4rd Edition], Digital Principles and Applications, Tata McGraw Hill.

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

# ADVANCED DATA STRUCTURES (ADS)

III Semester: (	CSE						Sche	me: 2017		
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS203	Professional Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL		
Sessional Eva	n Duration · 2 H	re	0	0	5	Fnd F	vam Duration:	3 Hrs		
Sessional Exa		15				Eng		5 111 5		
<b>Course Outcon</b>	nes: At the end of	the c	ourse s	tudent	ts will be ab	le to				
CO1: Understar	nd the concept of	Class,	Objec	t and	Dynamic M	emory allocation	on in C++.			
CO2: Illustrate	the applications of	of Link	ed Lis	ts, Sta	cks and Que	eues.				
CO3: Comprehe	end the operation	s perfe	ormed	on Bir	nary Search	Trees and AVI	Trees.			
CO4: Understand the Operations and Applications of Heaps.										
CO5: Organize the data using various Hashing Techniques for efficient Searching.										
<b>T</b> ( <b>1</b> ( <b>•</b> )				UN	11-1					
Introduction to C++ Structure of a C++ program, Class, Object, Scope Resolution operator, Defining Member functions, Constructors, Dynamic Memory allocation. UNIT-II Review of Elementary Data Structures: Arrays, Linked Lists, Stacks, Queues Applications of Linked lists: Polynomial manipulation.										
Applications of notation, Postfix Applications of	<i>Stacks:</i> Recursion evalute <i>Queues:</i> Breadth	on, Qu ation First	Search	rt, Pol	ish notation	s, Conversion o	of infix notation	to postfix		
				UNI	Γ– III					
Non Linear Date Operations on B Special Trees: S	<i>ta Structures:</i> Sinary Search Tree Splay Trees, B-Tr	es, AV ees an	/L Tree d their	es and opera	their operat tions.	tions, Threaded	Binary Trees.			
				UNI	T– IV					
<b>Priority Queues (Heaps):</b> Simple Priority Queues- Implementation using arrays and linked lists, Binary Heaps. Applications of Binary heap- Heap Sort; d-heaps, Leftist Heaps, Skew Heaps, Binomial Queues										
				UNI	T-V					
Hashing Techniques: Hashing Definition, Hash functions, Open Hashing (Separate Chaining), Closed Hashing (Open Addressing)- Linear Probing, Quadratic Probing, Double Hashing; Rehashing, Extendible Hashing. String Searching Techniques:										

History, Brute-Force algorithm, Knuth-Morris-Pratt algorithm, Boyer-Moore algorithm, Robin-Karp algorithm.

- 1. Herbert Scheldt, [4<sup>th</sup> Edition], The Complete reference C++, Tata McGraw-Hill
- 2. Jean Paul Tremblay and Paul G.Sorensen [2007], An introduction to Data Structures with Applications, TMH.
- 3. Robert Sedgewick, Algorithms in C, Addison-Wesley Publishing Company.

### **Reference Books :**

- 1. E.Balaguruswamy [2008], Object Oriented Programming with C++
- 2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C [Second Edition].
- 3. GAV Pai, Data Structures and Algorithms, Tata McGraw Hill Publications.

### Web References:

- 1. https://www.cprogramming.com/algorithms-and-data-structures.html
- 2. https://www.tutorialspoint.com/data\_structures\_algorithms
- 3. http://index-of.co.uk/Algorithms/Algorithms%20in%20C.pdf

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

# **DATABASE MANAGEMENT SYSTEMS (DBMS)**

<b>III Semester:</b>	CSE						Sche	me: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks					
CS205	Professional Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	Cole	3	0	-	3	40	60	100			
Sessional Exa	m Duration: 2 H	rs				End Exam Duration: 3 Hrs					
<b>Course Outco</b>	mes: At the end o	f the	course	studer	nts will be a	ble to					
CO1: Design E	R model for a pr	actica	l Real	life sy	stem.						
<b>CO2:</b> Use SQL commands to create, update, modify and retrieve data from the data bases.											
CO3: Understa	and the importanc	e of C	Good da	atabas	e design and	l indexing.					
CO4: Understa	ind the properties	of tra	insactio	ons in	a database s	system.					

CO5. U. 1. (a. 1.0)

**CO5:** Understand Concurrency control techniques and Recovery system.

# UNIT-I

*Introduction*: Introduction to DBMS, Purpose of Database Systems, Database System Applications, View of Data, Data Models, Database Users, Database Architecture.

*Entity-Relationship Model*: Basic Concepts, Cardinality of Relationship, ER Diagram Notations, Entity-Relationship Diagrams, Extended E-R Features, Modeling using ER Diagrams, Reduction of an E-R Schema to Tables.

# UNIT-II

*Structured Query Language (SQL):* Introduction to SQL, Data types, Data Definition language commands, Data Manipulation language Commands and Data control Language Commands,

Candidate Key, Primary key, Foreign key, Select Clause, Where Clause, Logical Connectivity's – AND, OR, Range Search, Pattern Matching, Order By, Group By, Set Operations – Union, Intersect and Minus, Aggregate Functions, Join Operations.

PL/SQL: Control Structures, Procedures, functions, Triggers and Cursors.

# UNIT-III

Relational Database Design: Features of Good Relational database Designs, Decomposition,

Normalization, Functional Dependency, Types of Normal Forms - First Normal Form, Second Normal Form, Third Normal Form, Boyce Codd Normal Form(BCNF), Fourth Normal Form and Fifth Normal Form.

*Indexing and Hashing*: Basic Concepts, Ordered Indices, Multilevel Indices, Secondary Indices, Static Hashing and Dynamic Hashing.

# UNIT-IV

*Transactions*: ACID properties of a Transaction, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions.

*Serializability* : Conflict Serializability, View Serializability, Recoverability –Recoverable and Non Recoverable Schedules, Cascade less Schedules, Testing for Serializability.

# UNIT– V

*Concurrency control:* Lock-Based Protocols, Timestamp-Based Protocols, Validation Based Protocols, Multiple Granularity, Deadlock handling.

*Recovery System*: Failure Classification, Storage Structure, Recovery and Atomicity- Shadow Paging Technique, Log-Based Recovery.

1. Henry F. Korth& Abraham Silberschatz [2005], [5 Edition], Data Base System Concepts, MC Graw Hill.

### **Reference Books :**

- 1. C J Date [2008], An Introduction to Data Base Systems, Pearson Education.
- 2. Raghu Ramakrishna and Johnannes Gehrke [2003], [3rd Edition], Data Base Management Systems, TATA Mc GrawHill.
- **3.** ElmarsiRamez and Navrate Shamkant B [2009], Fundamentals of Data Base Systems, Pearson Education.

### Web References:

- 1. https://www.w3schools.com/sql
- 2. https://www.tutorialspoint.com/plsql/index.htm

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### **End Exam**

# **COMPUTER ORGANIZATION & ARCHITECTURE (COA)**

Course Code         Category         Hours/Week         Credits         Maximum Marks           CS207         Professional Core         L         T         P         C         Internal Assessment         End Exam         TOTAL           Sessional Exam Duration: 2 Hrs         3         0         -         3         40         60         100           Sessional Exam Duration: 2 Hrs         End Exam         End Exam         TOTAL           Course Outcomes: At the end of the course students will be able to COI: Analyze the Computer Organization and Design of a Basic Computer.         CO2:           CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing         CO4:         TOTAL           CO3: Understand the netrenal working of an CPU, Pipeling and Vector Processing         CO3:         UNIT-1           Basic Computer Organization and Design         Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.           UNIT- II         Programmed Control:         Control Unit.           Programmed Control:         UNIT- II           Programmed Control:         Control Register Organization, Stack Organization, Instruction Formats, Addressing Micole Operations.           Micro Programmed Control:         Control, RISC and CISC.           Pipeline and Vector Processin	<b>III Semester:</b>	CSE						Scher	ne: 2017	
CS207       Professional Core       L       T       P       C       Continuous Internal Assessment       End Exam       TOTAL         Sessional Exam Duration: 2 Hrs       3       0       -       3       40       60       100         Sessional Exam Duration: 2 Hrs       End Exam Duration: 3 Hrs       End Exam Duration: 3 Hrs         Course Outcomes: At the end of the course students will be able to       .	<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
Image: Sessional Exam Duration: 2 Hrs         End Exam Duration: 3 Hrs           Course Outcomes: At the end of the course students will be able to         COI: Analyze the Computer Organization and Design of a Basic Computer.           CO2: Impart the knowledge of Programming the Basic Computer and the design of Micro programmed control unit         CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing           CO3: Understand the Computer Arithmetic and understand Input Output Organization on         CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages           CO4: Implement the Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.           UNIT-11           Programming The Basic Computer           Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.           Micro Programmed Control:           Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.           UNIT-111           Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.           UNIT-111           Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.           UNIT-111           Processing Unit           Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Progra	CS207	Professional Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
Sessional Exam Duration: 2 Hrs       End Exam Duration: 3 Hrs         Course Outcomes: At the end of the course students will be able to       CO1: Analyze the Computer Organization and Design of a Basic Computer.         CO2: Impart the knowledge of Programming the Basic Computer and the design of Micro programmed control unit       CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing         CO4: Implement the Computer Arithmetic and understand Input Output Organization       CO5: To understand the Internal working of an CPU, Pipeling and Vector Processing         CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages       UNIT-1         Basic Computer Organization and Design       Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer         Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.       UNIT-11         Programming The Basic Computer       UNIT-111         Programming The Basic Computer       UNIT-111         Programmed Control:       UNIT-111         Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.       UNIT-111         Programmed Control:       UNIT-111         Control Memory, Address Sequencing, Micro program Control, RISC and CISC.       Pipeline and Vector Processing         Parallel Processing Unit <td< td=""><td></td><td></td><td>3</td><td>0</td><td>-</td><td>3</td><td>40</td><td>60</td><td>100</td></td<>			3	0	-	3	40	60	100	
Course Outcomes: At the end of the course students will be able to CO1: Analyze the Computer Organization and Design of a Basic Computer. CO2: Impart the knowledge of Programming the Basic Computer and the design of Micro programmed control unit CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing CO4: Implement the Computer Arithmetic and understand Input Output Organization CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages UNIT-1 Basic Computer Organization and Design Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer. UNIT-II Programming The Basic Computer Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations. Micro Programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit. UNIT-III Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. Pipeline and Vector Processing Parallel Processing, Array Processors. UNIT-IV Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Sessional Exar	n Duration: 2 H	rs	1			End	Exam Duration	n: 3 Hrs	
Course Outcomes: At the end of the course students will be able to CO1: Analyze the Computer Organization and Design of a Basic Computer. CO2: Impart the Knowledge of Programming the Basic Computer and the design of Micro programmed control unit CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing CO4: Implement the Computer Arithmetic and understand Input Output Organization CO5: To understand the oncepts RAM, ROM, Virtual Memory and Secondary Storages UNIT-1 Basic Computer Organization and Design Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer. UNIT-11 Programming The Basic Computer Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations. Micro Programmed Control: Control Memory, Address Gequencing, Micro program Example, Design of Control Unit. UNIT-111 Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. Pipeline and Vector Processing Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. UNIT-1V Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache										
Control Computer Organization and Design of a Basic Computer.         CO2: Impart the knowledge of Programming the Basic Computer and the design of Micro programmed control unit         CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing         CO4: Implement the Computer Arithmetic and understand Input Output Organization         CO3: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages         UNIT-1         Basic Computer Organization and Design         Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.         UNIT-11         Programming The Basic Computer         UNIT-11         Programmed Control:         Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.         UNIT-111         Cont	Course Outcon	mes: At the end o	of the o	course	studer	ts will be al	ble to			
CO3: Indextant Number of Population of the Computer and the design of Micro programmed control unit         CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing         CO4: Implement the Computer Arithmetic and understand Input Output Organization         CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages         UNIT-1         Basic Computer Organization and Design         Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.         UNIT- II         Programming The Basic Computer         Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.         Mitro Programmed Control:         Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.         UNIT- III         Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.         Pipeline and Vector Processing         Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.         UNIT	CO1: Analyze	the Computer Of	rganiz	ation a	and De	sign of a Ba	usic Computer.	aign of Migro		
CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing CO4: Implement the Computer Arithmetic and understand Input Output Organization CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages UNIT-1 Basic Computer Organization and Design Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer. UNIT-11 Programming The Basic Computer Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations. Micro Programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit. UNIT-111 Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. Pipeline and Vector Processing Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. UNIT- IV Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT- V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	program	med control unit	Plogi	amm	ig the	Dasic Comp	outer and the de	sign of Micro		
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CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages UNIT-1 Basic Computer Organization and Design Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer. UNIT-II Programming The Basic Computer Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations. Micro Programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit. UNIT-III Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. Pipeline and Vector Processing Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. UNIT-IV Computer Arithmetic: Introduction, addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	CO4: Impleme	nt the Computer A	rithm	etic and	dunde	rstand Input	Output Organiza	ation		
UNIT-1           Basic Computer Organization and Design           Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.           UNIT-11           Programming The Basic Computer           Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.           Micro Programmed Control:           Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.           UNIT-111           Central Processing Unit           Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.           Pipeline and Vector Processing           Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.           UNIT-1V           Computer Arithmetic:           Introduction, Addition and Subtraction, Multiplication, Division algorithms.           Input/output Organization           Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.           UNIT-V           The Memory System:           Basic Concepts, Semiconductor RAM memories, R	CO5: To unde	rstand the concep	ots RA	M, RO	DM, V	irtual Memo	bry and Second	ary Storages		
UNIT-1 Basic Computer Organization and Design Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer. UNIT-II Programming The Basic Computer Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations. Micro Programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit. UNIT-III Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. Pipeline and Vector Processing Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. UNIT-IV Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache							-			
Basic Computer Organization and Design         Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.         UNIT-II         Programming The Basic Computer         Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.         Micro Programmed Control:         Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.         UNIT-III         Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.         Pipeline and Vector Processing         Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.         UNIT- IV         Computer Arithmetic:         Introduction, Addition and Subtraction, Multiplication, Division algorithms.         Input/output Organization         Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.         UNIT- V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	UNIT–I									
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Programming The Basic Computer         Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.         Micro Programmed Control:         Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.         UNIT- III         Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.         Pipeline and Vector Processing         Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.         UNIT- IV         Computer Arithmetic:         Introduction, Addition and Subtraction, Multiplication, Division algorithms.         Input/output Organization         Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.         UNIT- V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache					UNI	T– II				
Control Memory, Address Sequencing, Micro program Example, Design of Control Ont.         UNIT- III         Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. <i>Pipeline and Vector Processing</i> Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.         UNIT- IV         Computer Arithmetic:         Introduction, Addition and Subtraction, Multiplication, Division algorithms.         Input/output Organization         Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.         UNIT- V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Programming Introduction, M Logic Operation Micro Program	The Basic Comp. Iachine Language ns. <b>1med Control:</b>	<i>uter</i> e, Ass	embly	Langu	lage, The A	ssembler, Prog	ramming Arith	metic and	
UNIT-III         Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. <i>Pipeline and Vector Processing</i> Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.         UNIT-IV <i>Computer Arithmetic:</i> Introduction, Addition and Subtraction, Multiplication, Division algorithms. <i>Input/output Organization</i> Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.         UNIT- V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache		y, Address Seque	Incine	s, iviici			ic, Design of C	ontroi Onit.		
Central Processing Unit         Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing         Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.         Pipeline and Vector Processing         Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector         Processing, Array Processors.         UNIT- IV         Computer Arithmetic:         Introduction, Addition and Subtraction, Multiplication, Division algorithms.         Input/output Organization         Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority         Interrupt, DMA.         UNIT- V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache		• •			UNI	I – III				
Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC. <i>Pipeline and Vector Processing</i> Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. <u>UNIT-IV</u> <i>Computer Arithmetic:</i> Introduction, Addition and Subtraction, Multiplication, Division algorithms. <i>Input/output Organization</i> Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. <u>UNIT-V</u> <i>The Memory System:</i> Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Central Proces	sing Unit	0	. ,.	<b>C</b> 4	1.0.	·· • · ··		11 .	
Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. UNIT–IV Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT–V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Modes, Data Ti	cansfer and Manij	pulatio	on, Pro	n, Sta gram	Control, RIS	SC and CISC.	on Formats, A	adressing	
UNIT-IV         Computer Arithmetic:         Introduction, Addition and Subtraction, Multiplication, Division algorithms.         Input/output Organization         Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority         Interrupt, DMA.         UNIT-V         The Memory System:         Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Parallel Proce Processing, Arr	ssing, Pipelining ay Processors.	g, Aı	rithmet	tic an	d Instructio	on Pipeline,	RISC Pipeline	, Vector	
Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication, Division algorithms. Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache					UNI	Γ– IV				
Introduction, Addition and Subtraction, Multiplication, Division algorithms. <i>Input/output Organization</i> Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT–V <i>The Memory System:</i> Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Computer Arit	hmetic:								
Input/output Organization Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Introduction, A	ddition and Subtr	raction	n, Mult	tiplicat	tion, Divisio	on algorithms.			
Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA. UNIT-V The Memory System: Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Input/output Organization									
UNIT-V <i>The Memory System:</i> Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	Peripheral Dev Interrupt, DMA	ices, Input/outpu	t Inter	face, A	Asyncl	nronous Dat	ta Transfer, Mo	odes of Transfer	r, Priority	
<i>The Memory System:</i> Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache					UNI	T– V				
Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache	The Memory S	ystem:								
Memories -Mapping Functions, Virtual Memories, Secondary Storage.										

- 1. M. Morris Mano [2011], [3<sup>rd</sup> Edition], Computer system architecture, Pearson Education, 2011
- 2. Carl Hamacher, ZvonkoVranesie, SafwatZaky, [5<sup>th</sup> Edition], Computer Organization,
- McGraw-

## **Reference Books :**

- 1. Hayes John .P, Computer architecture & organization, MGH, 1998
- 2. Willam Stallings, [6 th Edition], Computer Organization and Architecture Designing for performance, Pearson [PHI], 2003

# **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

# **CONSTITUTION OF INDIA (CI)**

<b>III Semester :</b>	III Semester : CSE Scheme : 2017										
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Μ	aximum Mark	S			
ML201	Mandatory	L 2	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
Sessional Exe	am Duration : 2	Hrs	_	_	-	_		_			
		111.5									
Course Outc	omes :At the end	l of th	e cours	se the	student will	be able to					
CO1: Unders	tand the formation	on and	princi	ples o	f Indian Cor	nstitution.					
CO2: Unders	tand structure an	d func	ctions of	ofUni	on governm	ent and State e	xecutive. Dutie	s of			
Preside	ent, Vice presider	nt, Pri	me Mı	nıster,	Governor,	Chief Minister	cabinet and Sta	te			
Legisla	ature.	-1	1		42 44 74 7	(9)		4:			
Preside	President rule.										
<b>CO4:</b> Understand Indian social structure and languages in India. Rights of women, SC, ST and then weaker section.											
<b>CO5:</b> Understand the structure of Judiciary Role and functions of Supreme Court High court and											
Subordinate courts, Judicial review.											
UNIT - I											
Historical ba constituent A Constitution I	ck ground, Sign ssembly, Salien Fundamental righ	ifican t feat ts-De	ce of ures, t rivativ	Cons he Pr e prin	titution, Ma eamble, Cit ciples of sta	aking of the o izenship, proc te policy-Electi	constitution, R edure for amen ions in India.	ole of the ndment of			
Union Exoou	tivo: Structuros o	flin	ion Co	UN	ant & Eur	ations Drasida	nt Viao Drasid	lant Drima			
Minister, Cab Cabinet, State	inet, Parliament- Legislature	- State	e Exec	utive:	Structures a	nd Functions, (	Governor, Chie	f Minister,			
				UN	IT - III						
Central, State Constitutiona	Relations, President Relations	ident' Vorkir	s Rule 1g of P	, Cons arliam	stitutional A entary syste	Amendments [4 em in India	2, 44, 74, 76,	86 & 91]-			
				UN	IT - IV						
Indian Social S.C"s, S.T"s &	Structure, Langu to other weaker see	ages ctions	in Ind	ia-Poli	itical Parties	s & Pressure gr	oups, Rights o	of Women-			
				UN	NIT - V						
Judiciary: Structure, Organisation of Judiciary, independence of the Judiciary, role and functions of Supreme Court, High Courts & Sub ordinate courts, Judicial Review.											
Text Books :											
1. Durga D	as Basu, "Introa	luction	n to the	e Cons	titution of I	ndia", Wedwea	& Company				
2. Macivel	, Page, "An Intro	ductio	on Ana	lysis"	, Society						
3. M.V. Py	lee, "Indian Con	stitut	ion", S	. Cha	nd Publicati	ons					
4. Subhash	C Kashyao : "Ot	ur Co	nstituti	on",N	lationalBan	k,Trust, India.					
5. Constitutional Law of india by Dr.S.M.Rajan											

**Reference Books :** 

1. The Constitution of India.By the Ministry of Law and Justice, The Govt. of India.

- 2. Constitutional Law of India by kashyapsubhasah, c
- 3. Indian constitution Law by M.P.Jain
- 4. Constitutional Law of India by H.M Seervai

# Web References:

1. https://www.india.gov.in/my-government/constitution-india

# ADVANCED DATA STRUCTURES LAB (ADS (P))

III Semester: CSE						Sche	eme: 2017									
Course Code	Hours/	Week		Credits	Max	imum Marks										
CS204	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL									
	0	0	2	1	50	50	100									
Sessional Exam Duration	on: 2 Hrs			·	End H	Exam Duration	n: 3 Hrs									
Course Outcomes: At the CO1: Write programs us	ne end of sing Class	the cou and Ol	rse stuc bject co	lents will be ncepts.	e able to											
CO2: Implement Program	ms for the	e applic	ations of	of Linked l	ists, Stacks and Q	ueues.										
CO3: Perform operation	s on Bina	ry Sear	ch Tree	s and AVL	Trees.	-										
CO4: Develop programs for various Hashing Techniques.																
			List of	Experimen	ts											
1. Implementation of Cla	iss, Objec	t conce	pts	-												
2. Application of Linked I	List: Polyr	nomial c	operation	ns												
3. Applications of Stack of Expressions, Recurs	s: Conve sion	rsion o	f arithn	netic expres	ssions from one t	form to other,	Evaluation									
4. Application of Queue	: Graph tı	aversal	S													
5. Implementation of Bin	ary Searc	h Tree														
6. Implementation of AV	'L Trees															
7. Applications of Binary	y Heaps															
8. Implementation of Hashing Techniques																
Reference Books:																
1. Herbert Scheldt, [4 <sup>th</sup>	Edition],	The Co	mplete	reference (	C++, Tata McGrav	w-Hill.										
2. Jean Paul Tremblay a Applications, TMH.	nd Paul C	3.Soren	sen [20	07], An intr	oduction to Data S	Structures with	<ol> <li>Jean Paul Tremblay and Paul G.Sorensen [2007], An introduction to Data Structures with Applications, TMH.</li> </ol>									

# DATABASE MANAGEMENT SYSTEMS LAB (DBMS (P))

III Semester: CSE						Sche	me: 2017			
Course Code	Hours/	Week		Credits	Max	imum Marks				
CS206	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	0	0	2	1	50	50	100			
End Exam Duration: 3	Hrs									
Course Outcomes: At t	he end of	the cou	arse stu	dents will	be able to					
<b>CO1:</b> Work with the co	oncepts of	DDL,	DML, I	DCL Comr	nands.					
<b>CO2:</b> Design of database	ses for rea	al life s	ystems	using Orac	ele.					
CO3: Learning of SQL queries on the real life systems.										
CO4: Execution of PL/SQL programs for different problems										
<b>CO5:</b> Implementation c	of procedu	ure, fun	ction, t	rigger and	cursor concepts in	n PL/SQL				
	<u> </u>		List of I	Experimen	ets					
1. Perform DDL, DN	$\frac{1L \text{ and } D}{1L}$	$\frac{CL \text{ con}}{CL \text{ con}}$	<u>imands</u>			101				
2. Design and create	a Univers	sity Lib	rary Da	ta base usi	ng ER diagram a	nd Schema Dia	ıgram.			
3. Design and create Course, Instructor	and Stud	ersity ent usir	databas 1g ER N	e consistii Aodelling a	ng of the follow and Schema Diag	ram.	epartment,			
4. Create various tab banking system wi	oles like lith constra	Branch, aints us	Accou	int, Deposi chema diag	tor, Customer, L gram.	oan and Borro	ower for a			
5. Perform various S	QL querie	es on se	elect cla	use, where	clause, pattern m	natching, Order	by,			
and Group by.	- 1					C,				
6. SOL Oueries on Section 5	et operati	ons, Ag	ggregate	e functions	and Join Operation	ons.				
7. PL/SQL program u	using con	trol Str	uctures		1					
8. Program to implement Procedures and Functions.										
9. Program to implement Cursors.										
10. Program to implen	nent Trig	gers.								
		-								
Web References :										
1. https://www.w3scl	hools.con	n/sql								
2. https://www.tutori	alspoint.c	om/pls	ql/inde	x.htm						

# ADVANCED COMMUNICATION SKILLS LAB (ACS(P))

II/IV Semester: Common for all				Scheme :	2017							
Branches												
Course Code	Hours/	Week	-	Credits	Maximum Mai	rks						
HU203	L	Т	Р	С	Continuous Internal Assessment	TOTAL						
	0	0	2	1	100	100						
Course Outcomes : At	the end	of the	COURSE	students w	ill be able to							
CO1: Sneak in English	confide	ntly flu	iently a	and effectiv	velv							
CO2: Exhibit team play	ving and	leaders	shin ski	ills	ciy.							
CO3: Give Presentation	ns effect	ivelv	sinp ski									
<b>CO4:</b> Comprehend the	CO4: Comprehend the Verbal and Non-verbal texts.											
CO5: Prepare Resume, Company profiles and Project presentations.												
CO6: Enhance possibilities of Job prospects.												
List of Activities												
Focus in the lab is more	on fluer	ncy thar	n on ac	curacy								
1. Ice breaking Activit	ies											
2. JAM												
3. Listening Comprehen	nsion – F	Practice	tests									
4. Oral Presentation												
5. Presentation Strategi	es											
6. Group Discussion – 7	Team Pla	aying, I	Leaders	ship Skills								
7. Debate	<b>X</b> 7 1	14 NT	1	1 1 1 1 1 7 .	X7							
8. Information Transfer	- verba	ll to No	n-verb	al and Vice	e-versa							
9. Resume Preparation	r											
11 Interview Skills	a) Telen	honic I	ntervia	<b>W</b>								
	h) Perso	nal Inte	rview	vv								
12 Project Presentation												
<b>Reference Books :</b>												
1. Communication Sk	tills, San	jay Ku	mar and	d PushpLat	a, Oxford University Press.							
2. English Language	Laborato	ries A	Compr	ehensive N	Ianual, NiraKonar, PHI.							
3. Technical Commun	nication	3 E, Ra	man ar	nd Sharma,	Oxford University Press.							
<ol> <li>Personality Development and Soft Skills, Barun k. Mitra, Oxford University Press.</li> </ol>												

# PROBABILITY AND STATISTICS (PS)

IV Semester : CSE					Scheme : 2017				
Course Code	Category	Hours/Week			Credits	Maximum Marks			
BS204	Foundation	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	-	-	3	40	60	100	
Sessional Exam Duration : 2 Hrs						End	Exam Du	ration: 3 Hrs	

Course Outcomes : At the end of the course the student will be able to							
<b>CO1:</b> Gain the knowledge on Mathematical Statistics and probability theory							
CO2: Classify discrete and continuous distributions							
CO3: Understand the test of hypothesis for large samples							
CO4: Analyze the Test of significance for small samples							
CO5: Find correlation coefficient and classification of ANOVA							
UNIT – I							
<i>Statistical Methods:</i> Introduction to statistics, Frequency distribution, Measures of Central Tendency, Measures of dispersion, Moments.							
<b>Probability:</b> Basic concepts of probability, Addition and Multiplication law of probability, Mathematical Expectation -Variance and Co-variance.							
UNIT - II							
<b>Probability Distributions:</b> Random variable – Discrete and continuous probability distributions and Functions; Binomial, Poisson and Normal distributions.							
UNIT – III							
<i>Test of Hypothesis:</i> Population and sample, Confidence interval of mean, Statistical hypothesis – Null and Alternative hypothesis, Level of Significance and Critical region, Z-test for means and Proportions.							
UNIT - IV							
<i>Test of Significance:</i> Student t-test - sample mean, difference between sample means and paired Student t-test, F – test, Chi-square test –Goodness of fit and independence of attributes. UNIT - V							
Correlation: Co. afficient of Correlation Lines of regression and Rank Correlation							
Analysis of Varianaa : A NOVA for One way classification ANOVA for Two way classification							
Analysis of variance. ANOVA 101 One-way classification, ANOVA 101 1 wo-way classification							
Text Books							
1 Gunta and Kanur Fundamentals of Mathematical Statistics: S Chand & Company New Delhi							
2 T K V Ivengar and others -Probability And Statistics S Chand & Company, S <sup>th</sup> Edition, 2015							
3 B S Grewal [2012] HigherEngineering Mathematics Khanna Publishers NewDelhi							
5. 2.5. Stown [2012], Heidelighteering muthematics, Khanna i abhonois, item Denni.							

# **Reference Books**

- 1. K.Murugesan & P.Gurusamy, Probability And Statistics, Anuradha Publications
- 2. Probability And Statistics, Murray R Spiegal and others, Schaum's series, Tata Mcgraw Hill Education.
- 3. Leomard Kazmier, Business Statistics, Schaum's series, Tata Mcgraw Hill Education

#### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam

# **OBJECT ORIENTED PROGRAMMING (OOP)**

<b>IV Semester:</b>	IV Semester: CSE					Scheme: 2017				
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS208	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	Core	3	0	-	3	40	60	100		
Sessional Exam	n Duration: 2 H	rs				End E	xam Duration:	3 Hrs		
Course Outcon	mes: At the end o	f the	course	studer	ts will be al	ole to				
CO1: Understa	nd fundamentals	of oo	p conc	epts, c	lass, input a	nd output				
CO2: Explain	Inheritance, packa	ages a	nd inte	erface	1 11.					
CO4: Apply multi threading concents, files										
CO4: Apply multi threading concepts, files										
CO5: Understa	ind applet program	nming	g, AW	I and	event handlı	ng				
				TINI						
				UN	1-1					
Object oriented	l concepts:	_		_	_		_			
Fundamentals, Overview of Java, Java buzzwords, Data types, variables and arrays. Operators, control										
statements. Introducing Classes: Class fundamentals, declaring objects, introducing methods,										
Constructors, Reading console input, writing console output, this keyword, garbage collection,										
<i>Inheritance:</i> Inheritance basics, using super, method overriding, dynamic method dispatch, abstract class, using final with inheritance. <i>Packages and Interfaces:</i> Defining package, access protection, importing packages. Interfaces: Defining interface, implementing interface										
				UNI	Γ– III					
String Handlin String construct strings, modify Exception Han Fundamentals, your own except	g: etors, Special string ing strings. String adling: exception types, ption subclasses.	ring o Buffe try, o	operation er class catch,	ons, c and it throw,	haracter ex s methods. throws, fin	traction, string nally. Java buil	g comparison, s	searching		
				UNI	Γ– IV					
Multithreading Java thread me methods, isAliv Files: Reading and we	<i>Multithreading:</i> Java thread model, Main thread, creating a thread, creating multiple threads, Thread class and its methods, isAlive(), join(), thread priorities, synchronization, interthread communication. <i>Files:</i> Reading and writing files									
				UNI	T– V					
Applet: Applet basics a AWT Controls TextArea. Event Handlin Adapter classes	WIT-V         Applet:         Applet basics and Applet class.         AWT Controls:       Label, Button, Checkbox, Checkbox Group, Choice, List, Scrollbar, TextField, TextArea.         Event Handling:       Delegation event model, Event Classes, sources of events, event listener interfaces.         Adapter classes.									

1. Herbert Schildt [2008], [5th Edition], The Complete Reference Java2, TATA McGraw-Hill.

2. E Balaguruswamy [2007], [3<sup>rd</sup> Edition], Programming with Java, A Primer, TATA McGraw-Hill

### **Reference Books :**

- 1. Bruce Eckel [2008], [2nd Edition], Thinking in Java, Pearson Education.
- 2. H.M Dietel and P.J Dietel [2008], [6th Edition], Java How to Program, Pearson Ed.

### Web References:

1. https://www.tutorialspoint.com/java/index.htm

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam

# **OPERATING SYSTEM (OS)**

IV Semester: C	CSE				Scheme: 2017					
<b>Course Code</b>	Category	Ho	urs/W	eek	Credits	Maximum Marks				
						Continuous				
CS210	Professional	L	Т	Р	С	Internal	End Exam	TOTAL		
	Core					Assessment				
		3	0	-	3	40	60	100		
Sessional Exa	am Duration: 2	2 Hrs					End Exam Du	ration: 3 Hrs		
	A / /1	1 64	1	41	4 1 4	·11.1 1.1 4				
Course Outco	mes: At the en		he cou	rse, the	e students w	ill be able to				
CO2: Unders	tand the OS de	sign s sta of	proces	es and	luling super	bronization and its	implementation			
CO3: Exemplify the memory management techniques and virtual memory										
<b>CO4:</b> Understand the structure and organization of file system and secondary storage structure										
CO5: Unders	tand Deadlock	hand	ling me	chanis	ms Protect	ion and Security se	rvices and Linux	Case Study		
	Cost of decision Deactock handling mechanisms, i forection and security services and Linux Case study.									
UNIT-I										
Introduction:										
What Operating	ng Systems Do	o, Op	erating	, Syste	m Structure	e, Operating Syste	m Operations,	Overview of		
Process Mana	igement, Mem	ory N	Manage	ement,	Storage M	anagement, Protec	tion and Security	v, Computing		
Environments										
Operating System Structures:										
Operating System Services, User Operating System Interface, System Calls, Types of System Calls,										
Operating Sys	Operating System Structure.									
UNIT–II										
Process Mana	igement:	Drago	ag Sab	adulin	a Onoration	na an Draaaaaaa k	ntar rraggi Car	munication		
Examples of I	PC Systems T	rread	$\sim 0$ Ver	view	g, Operation Multicore P	rogramming Mult	ithreading Model			
Svnchronizati	on Background	nd T	he Crit	tical-Se	ection Prob	lem Peterson's S	olution Semanh	ores Classic		
problems of S	vnchronization	. Mor	itors.	ileur D			oration, Somaph			
Process Sched	luling:	,								
Basic concepts	s, Scheduling C	riteri	a, Sche	duling	Algorithms	s, Real Time CPU S	Scheduling-RMS	& EDF		
	<u> </u>		·		UNIT_III	·				
Mamory Man	agamont.					-				
Main Manor	ugement. Bookground	Swor	ning (	Contin	oua Mamar	Allocation Same	ntation Daging	Structure of		
the Page table	/ Dackground,	Swap	iping, v	contigi	ious memory	Anocation, Segur	intation, 1 aging,	Structure of		
Virtual Memo	<b>rv</b> Background	Dem	and nad	oing P	age Renlace	ement Allocation of	f Frames Thras	hino		
<i>intutti</i> 1/10/110	Ty Dackground,	Dum	unu pug	51116, 1	UNIT_IV		Ji i iunes, i mus	iiiig.		
Storage Man	agement:									
Mass Storage S	Structure: Overv	iew o	f Mass-	Storag	e Structure,	Disk Structure, Di	isk Scheduling.			
File System I	nterface: File	Conc	epts, A	ccess l	Methods, D	irectory and Disk S	Structure,			
File System Implementation- File system Structure, File system Implementation, Directory										
Implementation, Allocation Methods, Free-Space Management.										
					UNIT-V					
Deadlocks:		~.								
System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention,										
Deadlock Avoldance, Deadlock Detection, Recovery from Deadlock.										
Protection and	a Security:									

*Protection:* Goals of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of access rights,

Security: The Security problem, System and Network Threats.

CASESTUDY: The Linux Operating System:

History, Design Principles, Kernel Modules, Process Management.

### **Text Books :**

1. Silberschatz, Galvin and Greg Gagne, Operating System Concepts, 9<sup>th</sup>edition, WILEY INDIA Edition.

### **Reference Books :**

- 1. Operating System : Internals and Design principles, 5<sup>th</sup> Edition, Willam Stallings Prentice Hall of India.
- 2. Gagne[2003],[6thEdition],Operating System Concepts, John Wiley & Sons, Inc publishers.
- 3. Tanenbaum [2000], Modern Operating System, Pearson Education..

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8marks each.

# End Exam

# **COMPUTER NETWORKS (CN)**

IV Semester: C	CSE				Scheme: 2017					
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks				
CS211	Professional Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	-	3	40	60	100		
Sessional Exan	n Duration: 2 Hi	·s			End Exam Duration: 3 Hrs					
<b>Course Outcon</b>	nes: At the end of	f the c	ourse	studen	ts will be at	ole to				
CO1: Understa Network	<b>CO1:</b> Understand Network models and Physical layer Understand Data Communication Systems, Network models and its Protocols									
CO2: Study the	<b>CO2:</b> Study the techniques used in data link layer.									
CO3: Understan	nd the routing stra	ategie	s for a	n IP ba	ased networl	king infrastruct	ure.			
CO(1) $C(1)$ $C(1)$ $C(1)$		1 1	• .	4 1	•					

**CO4:** Study of congestion control and internetworking concepts.

**CO5:** Understand connection establishment and services provided by TCP and UDP

# UNIT-I

*Introduction:* Data communications, Networks, Protocols and standards, The OSI Model – Layered architecture, Layers in OSI Model, TCP/IP Protocol Suite, Addressing – Physical addresses, Logical addresses, Port Addresses.

*Physical layer and Transmission Media:* Analog and digital – Analog and digital data, Analog and digital signals, Digital signals – Bit rate, Bit length, Transmission of digital signals, Transmission Impairments – Attenuation, Distortion and Noise, Performance – Bandwidth, Throughput, Latency, Jitter.

# UNIT-II

*Data Link Layer:* Error detection – Introduction, Block coding – error detection, error correction, hamming distance and minimum hamming distance, CRC codes, Checksum. Framing, Flow and error control.

# UNIT–III

*Network layer:* Design Issues: store-and-forward, services to transport layer, connection less and Connection oriented services, comparison of virtual circuits and datagram subnets.

*Routing Algorithms:* The optimality principle, shortest path routing, Flooding, Distance vector and Link state, Hierarchical, Broadcast and Multicast Routings.

# UNIT-IV

*Congestion Control:* Principles, congestion prevention policies, congestion control in virtual circuits and datagram subnets, load shedding, jitter control.

*Internetworking:* Concatenated virtual circuits, connection less internetworking, tunnelling, Internet work routing, Fragmentation. The IP protocol, IP address, Internet Control protocols, Gateway routing protocols: OSPF, BGP.

# UNIT-V

*Transport Layer:* UDP, TCP- service model, protocol, segment header, connection management, Transmission Policy, congestion control and timer management.

Application Layer: The DNS Name Space, Resource Records, Name Servers.

- 1. Behrouz A. Forouzan [2006][4th Edition], Data communications and Networking, MGH.
- 2. Andrew S. Tenenbaum [2007], [4th Edition], Computer Networks, Pearson Education.

#### **Reference Books :**

- 1. William Stallings ,Data and Computer Communications, Seventh Edition or Eighth Edition
- 2. An Engineering Approach to Computer Networks, S.Keshar, [II Edition], Pearson Education.
- 3. Computer Networking: A Top-Down Approach Featuring the Internet, James F, Keith W.Ross, [V Edition], Pearson Education.
- 4. Computer networks and internets, Douglas E Comer [6th Edition], Pearson Education.

### Web References:

1. https://www.tutorialspoint.com/data\_communication\_computer\_network/index.htm

### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### **End Exam**

# **DESIGN & ANALYSIS OF ALGORITHMS (DAA)**

IV Semester: C	CSE							<b>Scheme: 2017</b>			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks				
CS212	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	0.010	3	0	-	3	40	60	100			
Sessional Exar	n Duration: 2 H	rs					End Exam	Duration: 3 Hrs			
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		2.1									
Course Ourcomes: At the end of the course students will be able to											
<b>CO1:</b> Understand time, space complexities, notations, Divide and conquer technique to solve problems.											
CO2: Understa	nd Dynamic prov	u io si	nve pr	hniau	s. le to solve n	rohlems					
CO4: Understa	nd Backtracking	and b	ranch d	& boui	nd technique	es and solve pro	oblems				
<b>CO5:</b> Understand basic tree traversal and searching techniques and finding the lower bound for											
various applications											
UNIT– I											
<i>Introduction:</i> What is an Algorithm? Performance Analysis: Space &Time Complexities, Asymptotic notation, Probabilistic analysis, Amortized analysis. <i>Divide and Conquer:</i> General method, Binary search, Finding Maximum and Minimum, Merge sort, Quick sort, Strassens Matrix Multiplication											
					UNIT-II						
<i>Greedy Metho</i> Deadlines, Min Shortest Paths.	d: The Gener iimum-Cost Spar	al Me nning	ethod, Trees,	Knap Optin	sack Proble nal Storage	em, Tree Vert on Tapes, Opt	ex splitting, Jo imal Merge Par	b Sequencing with tterns, Single Source			
					UNIT-III						
<i>Dynamic Prog</i> Search Trees, S	<i>ramming :</i> The tring Editing pro	Gener blem,	ral Me 0/1-Ki	thod, and the	Multistage ( k, Reliabilit	Graphs, All Pa ty Design, The	irs Shortest Par Travelling Sales	ths, Optimal Binary sperson Problem.			
					UNIT-IV						
<i>Backtracking:</i> Cycles.	The General Me	thod, T	The 8-	Queen	s Problem,	Sum of Subsets	s, Graph Colorii	ng, and Hamiltonian			
Branch and Bo	ound: The Metho	od, 15	Puzzle	proble	em, Travelli	ng Salesperson	l <b>.</b>				
					UNIT-V						
Basic Traversa Components an Lower Bound problems.	al and Search T ad DFS. <i>Theory</i> : Compa	echnig rison	<i>ques</i> : 7 Trees	Fechni , Orac	ques for Bi cles and A	nary Trees, Te dversary Argu	chniques for G uments, Technie	raphs, Bi-connected ques for Algebraic			

1. Ellis Horowitz, SartazSahni& Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Galgotia Publications Second Edition.

### **Reference Books :**

1. Jon Kleinberg, Eva Tardos, Algorithm Design, Pearson Education Seventh Impression.

## **Question Paper Pattern:**

### **Sessional Exam**

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

# **SOFTWARE ENGINEERING (SE)**

<b>IV Semester: CSI</b>	E				Scheme: 2017						
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks				
						Continuous					
CS213	Professional	L	Т	Р	С	Internal	End Exam	TOTAL			
00210	Core					Assessment					
	0.010	3	0	-	3	40	60	100			
Sessional Exam I	<b>Duration: 2 Hrs</b>					End E	xam Duration:	3 Hrs			
-											
Course Outcome	Course Outcomes: At the end of the course students will be able to										
<b>CO1:</b> Understand t	the phases of softw	are de	velopm	ent life	e cycle and Pr	rocess models					
CO2: Demonstrate Requirement Engineering process and change management											
CO3: Understand	the design concep	ts, des	sign mo	odels, a	rchitectural	styles and patter	ms				
CO4: Explain Wh	ite box testing and	Black	k box t	esting t	echniques						
CO5: Understand	Risk Mitigation N	Ionito	ring M	anagen	nent plan, So	oftware Quality	Assurance activi	ties			
and Quality	y standards										
UNIT–I											
Introduction To Software Engineering And Process Models: The Evolving role of software, Changing nature											
of software, Software myths.											
<b>Sujiware Engineering:</b> A Layered Technology, A Process Framework. <b>Process Models:</b> The Waterfall model Incremental process models. Evolutionary process models. The											
Unified process A	gile process model	le	meren	iciliai	process mo	dels, Evolution	ary process mo	ueis, The			
	gile process model	15.		TINIT	, II						
UNII-II											
User requirements	System requirem	ents 7	Engine The Sot	ftware i	requirements	s document	in-tunctional req	unements,			
Requirement Eng	ineering Process:	Feasi	hility s	studies	Requirement	nts elicitation at	nd Analysis Red	mirement			
validation, Require	ement Managemen	nt.	onney s	, a di cos,	itequiterile		iu i iliui joio, itee	141101110111			
				UNIT	_ 111						
<b>Design:</b> Design pr	ocess and Design	າດແສ	itv De	esign c	concepts-Abs	straction Inform	nation Hiding	Functional			
Independence, Refa	actoring, Modulari	ity, Re	fineme	ent, De	sign Classes	, Design Model.					
Creating an Arch	itectural Design:	Softw	vare Ai	chitect	ture, Data D	esign- Data De	sign at architec	ture level,			
Data Design at com	ponent level, Arc	hitectu	ıral Sty	yles & I	Patterns. Arc	chitectural desig	n.				
				UNIT	_ IV						
Tosting & Motri	es. Testing Strat	eoies-	A Str	ategic	annroach t	o Software tes	ting Test stra	tegies for			
Conventional softw	are. White Box T	esting	- Basis	Path 7	Testing. Con	trol Structure Te	esting. Black Bo	x Testing.			
Validation Testing,	System Testing,	The ar	t of De	buggin	ig.						
Metrics for Process	& Products: Soft	ware N	Measur	ement,	Metrics for	software quality	<i>.</i>				
				UNIT	<u>- V</u>						
Risk Managama	nt. Risk Manage	ement.	Read	tive x	vs Proactiv	e risk strategi	es Software ri	eke Rick			
identification. Risk	projection. Risk r	efinen	nent. R	MMM	. RMMM pl	an.	cs, soltware in	SK5, ICISK			
Quality Manageme	ent: Quality Mana	gemer	ıt- Qua	lity Co	ncepts, Soft	ware quality ass	urance, Softwar	e reviews,			
Formal technical r	eviews, Statistica	l softv	ware q	uality a	assurance, S	Software reliabil	ity, The ISO 90	00 quality			
standards.				-				-			

- 1. Roger S.Pressman [2005], [7th Edition], *Software Engineering, A Practitioner's Approach*, Mc Graw Hill, International Edition.
- 2. Sommerville [2008], [7th Edition], *Software Engineering*, Pearson education.

### **Reference Books :**

- 1. K.K.Agarwal&Yogesh Singh [2008], Software Engineering, New Age International Publishers.
- 2. James F.Peters, Witoldpedecz, John Wiely [2008], Software Engineering-an Engineering approach.
- 3. Software Engineering, Pankaj Jalote's, A Precise Approach, Wiley

### Web References:

- 1. 1. https://www.tutorialspoint.com/software\_engineering/software\_engineering\_tutorial.pdf
- 2. 2.http://www.niecdelhi.ac.in/uploads/Notes/btech/4sem/cse/21378403-Software-Engineering-
  - -K-Aggarwal-YogeshSingh-Full-Notes.pdf

# **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam

# **ENVIRONMENTAL STUDIES (ES)**

IV Semester: C	ommon for CSE	E & E	CE				Se	cheme : 2017		
<b>Course Code</b>	Category	Ho	urs/W	eek	Credits	Ν	/laximum M	arks		
ML02	Mandatory	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		2	-	-	-	-	-	-		
Sessional Exam	n Duration : -					End	Exam Durat	ion:-		
Course Outcomes : At the end of the course students will be able to										
<b>CO1:</b> Apply th	e knowledge o	f env	ironme	ental i	ssues in hi	s area of work.	Appreciate t	he need for the		
conserva	ation of Natural	resou	rces to	r susta	inable deve	lopment.	4			
CO2: Understar	ids the importan		Ecosys	stem a	na conserva	tion of blodivers	ity maagurag and	inguage related to		
environi	environment.									
CO4: Appreciat	e the disaster m	anage	ement i	n prev	vention of lo	ss of life and pro	perty			
CO5: Appreciat	the use of IT a	& rela	ated tec	hnolo	gy to consei	rve environment	& human heal	th.		
				١	UNIT - I					
Introduction to 1	Environmental s	studie	es and I	Natur	al resources	•				
Definition, scop	Definition, scope, importance and multidisciplinary nature of Environmental studies. Need for public									
awareness.	s-Growing energy	w ne	eds no	n_rene	wable and i	renewable energy	v resources. H	vdroelectric solar		
Energy resources-Growing energy needs non-renewable and renewable energy resources: Hydroelectric, solar, wind and nuclear energy resources. Water resources-Use and over exploitation of surface and ground water										
Dams and its effects on forest and tribal people. Forest resources- uses of forest, deforestation causes and										
effects. Food resources- changes caused by agriculture and over grazing. Modern agriculture and its effects.										
Role of individual in conservation of natural resources.										
UNIT - II										
<b>Concepts of ecosystem:</b> Structure and function of an ecosystem Energy flow in an ecosystem (single channel energy flow model)										
Ecological succe	ession. Food cha	ains,	food w	vebs a	nd ecologic	al pyramids. Int	roduction, typ	es, characteristic		
features and func	tions of grassla	nds, d	esert, p	ond a	nd ocean ec	osystems.				
				1	UNIT - III					
<b>Biodiversity</b> and	its conservation	1:	. 1	0.1	<b>.</b> .					
Definition, level	ls of blodivers	ity. N	alues	of bi	lodiversity-	consumptive, p	roductive, so	cial, ethical and Endangered and		
endemic species	of India. Threat	s to b	oiodive	rsity-F	Iabitat loss.	poaching of wild	d life and man	-wild life conflict.		
Conservation stra	ategies-In situ a	nd ex	situ co	nserv	ation.	1				
	-			1	UNIT - IV					
Environmental p	ollution:									
Definition, cause	es, effects and c	ontro	l meas	ures o	f air, soil,w	ater and noise point	ollution. Disas	ter management-		
management-Mu	nicipal solid wa	ste R	ole of	an -ing	looar warm lividual in n	revention of poll	ution	depietion. waste		
	interpuisona via	510.11		un m	UNIT - V	revenuent of poin				
Social issues and	l the environme	ent								
Consumerism an	nd waste produ	cts. 1	From <b>u</b>	ınsust	ainable dev	elopment to sus	stainable deve	lopment. Salient		
features of Air	Act, water Ac	t and	d Fore	st con	nservation A	Act. Process inv	volved in the	enforcement of		
Environmental le	gislation. Role of	of Inf	ormatio	on I ec	hnology in o	environment and	human health			
Torthooks										
1 C D V ou	chik and Anubl	na V	uchil	" En-	vironmentel	Studies" Now	a Internatio	nal(n) I td Now		
Delhi	I. C.P. Kausnik and Anubha Kausnik, "Environmental Studies" New Age International(p) Ltd., New Delhi									
2. R.Rajagopalan "Environmental Studies", Oxford University press, Chennai										
3. Y.Anjane	yulu" Introduct	ion to	• Envir	onmer	tal sciences	", BS Publication	ns, Hyderabad			
Reference books										
1. Benny Jos	eph. "Environm	ental	Studie	s", Ta	ata McGraw	Hill, New Delhi				
2. Barucha E	trach, "Environn	nenta	l studie	s", Ur	niversities pr	cess.				

# BASIC ELECTRONICS LAB (BE (P))

IV Semester: CSE						,	Scheme:2017			
Course Code	He	ours/W	eek	Credits	Ma	aximum Marl	KS			
EC212	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	0	0	2	1	50	50	100			
End Exam Duration: 3 Hrs										
Course outcomes: Up on successful completion of this course, the student shall be able to										
<b>CO1:</b> Study and analyze the operation of cathode-ray oscilloscope (CRO) for Sinusoidal, Triangular, Square										
wave forms and phase calculation using lissajous figures.										
CO2: Plot the V-I characteristics of PN-Diode, Zener diode to understand their behavior and calculate cut-in voltage, breakdown voltage										
<b>CO3</b> : Design half wave and full wave rectifiers with filters, calculate ripple factor and percentage of regulation.										
and plot the characteristics										
CO4: Design Common Base(CB) and Common Emitter (CE) configuration and Characterize the current flow										
of a bipolar transistor in C	B and C	E confi	guratio	ns						
CO5: Realize Boolean expression	1 using l	ogic gat	es and d	lesign Hal	f adder and Full	adder Circuit				
CO6: Design and realize the truth	n tables t	for Mult	iplexer a	and Shift	register					
<b>CO7:</b> Study and analyze the basic	c operati	on of O	peration	al Ampli	tier (OP-AMP-	/41)				
				• ,						
1 Study of Electronic equipp	aant C		t of Exp	eriments						
2 Semiconductor Diodo Cha	reatorist	$\frac{1}{100}$ (n n	5, allu r diada ar	d Zopor (	diada)					
3 Half Wave and Full wave 1	Rectifie	rs (p-11	ulouc al							
4 Transistor Characteristics -	- CE Co	nfigura	tion							
5. Transistor Characteristics -	-CBCc	nfigura	tion							
6. Verification of Logic Gate	s									
7. Half Adder and Full Adde	r									
8. Multiplexers and Decoder	8. Multiplexers and Decoders									
9. Verification of Flip flops										
10. Shift Register	10. Shift Register									
11. Inverting and Non Invertin	g Ampl	ifier								
12. Summing and Difference A	Amplifi	er								

# **OBJECT ORIENTED PROGRAMING LAB (OOP(P))**

IV Semester: CSE					Scher	ne: 2017				
Course Code	Hours	Week		Credit	Max	imum Marks				
CS209	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	0	0	2	1	50	50	100			
<b>End Exam Duration:</b>	3 Hrs									
<b>Course Outcomes:</b> At the end of the course students will be able to										
CO1: Implement class, object and constructor in java.										
CO2: Develop programs using packages and Interfaces.										
<b>CO3:</b> Perform operation	CO3: Perform operations on strings									
CO4: Implement the concept of multithreading and file										
CO5: Design applets with event handling mechanism										
List of Experiments										
1. Class, object, Const	tructor: S	Student	details	s, complex	x number arithme	etic operations,	transpose			
01 a matrix. 2 Inheritance: Multile	vel Hier	rarchics	al							
3 Packages: Access p	rotection									
4 Interface: Multiple i	inheritan	ce usin	g inter	face						
5 String handling: Str	ing class	and its	s metho	ods						
6. Exception handling	: built-in	except	tions ar	nd custom	exceptions					
7. Multithreading: crea	ating mu	ltiple th	nread u	sing Thre	ad class and Run	nable interface	,			
8. Files: Reading and v	vriting.	1		0						
9. AWT controls: Dray	wing var	ious sh	apes ai	nd factoria	al of a number					
10. Event handling: mo	use even	ts and	keyboa	rd events						
			-							
<b>Reference Books :</b>										
1. Herbert Schildt Hill.	[2008],	[5th Ec	lition],	The Con	nplete Reference	Java2, TATA	McGraw-			

# SOFT SKILLS LAB (SS(P))

III/IV Semester : Con	nmon fo	r all		Scheme : 2	2017				
Branches									
<b>Course Code</b>	Hours/	Week		Credits	Maximum Ma	rks			
HU204	L	Т	Р	С	Continuous Internal Assessment	TOTAL			
	0	0	2	1	100	100			
	1	1 64			11.1 1.1 .				
Course Outcomes : A	t the end	$\frac{1}{1}$ of the	course	students wi	Il be able to	1.11 .41			
<b>COI:</b> Communicate	effective	ly and	enhan	ce their inte	erpersonal relationship buildi	ng skills with			
CO2: Work together in teams and accomplish objectives in a cordial atmosphere									
CO2: Work together in teams and accomplish objectives in a cordial atmosphere									
CO3: Face interviews, GDs and give presentations									
<b>CO5:</b> Learn the Principles of Personal effectiveness									
COS. Learn the Thileples of Tersonal effectiveness									
List of Activities									
1 Ice breaking Activities Principles of Time and Stress Management									
2. Art of speaking			<u>, , , , , , , , , , , , , , , , , , , </u>						
3. Art of writing - Essa	ay / Picti	ure / Ste	ory						
4. Business etiquette -	Telepho	ne and	email						
5. Presentation Skills -	- Power	point m	aking						
6. Group Discussion –	Objectiv	ves and	Skills	tested in a C	GD, types of GD, Dos and don	'ts & practice			
7. Team work - Drama	a / Skit /	Role pl	lay						
8. Paper / Poster Prese	ntation								
9. Problem Solving by	<u>lateral t</u>	hinking	g puzzle	es					
10. Know your Genera	al Aware	ness / I	Snowle	edge – Quiz					
11. Principles of Perso	onal exce	lience							
12. Interview Skills									
<b>Reference Books :</b>									
1. Stephen R. Covey,	"The Se	ven Ha	bits of	Highly Effe	ctive People", Pocket Books	Publishers,			
London									
2. Priyadarshani Patn	aik, "Gro	oup Dis	scussion	n and Intervi	ew Skills with VCD", Found	ation Books.			
3. Sangeeta Sharma & Learning Private L	&Binod I imited.	Mishra,	"Com	munication S	Skills for Engineers and Scien	tists", PHI			
4. Shiv Khera, "You	Can Win	", <u>Ma</u> c	Millan	India Publis	shers, New Delhi				
5. Campus Connect P http://campusconne	ortals - T	Γ <mark>CS -</mark> h ys.com/	nttps://c	ampuscomn	nune.tcs.com; Infosys -				
### FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

CSE –V Semester

S. No.	Course		Credite	Scl Ins peri	heme of truction ods/wee	n ek	Sche M	Scheme of Examination Maximum Marks			
5. NO	No.	Course Title	Creatis	L		Р	End Exam Marks	Internal Assessment Marks	Total Marks		
Ι		<b>Theory</b>									
1.	EC313	Introduction to Microprocessors & Microcontrollers	3	3	0	0	60	40	100		
2.	CS301	Data Mining	3	3	0	0	60	40	100		
3.	CS303	Formal Languages and Automata Theory	3	3	0	0	60	40	100		
4.	CS304	Web Technologies	3	3	0	0	60	40	100		
5.		Professional Elective-1	3	3	0	0	60	40	100		
6.		<b>Open Elective-1</b>	3	3	0	0	60	40	100		
II		Practical									
7	CS302	Data Mining Lab	1	0	0	2	50	50	100		
8.	CS305	Algorithms & Computer Networks Lab	1	0	0	2	50	50	100		
9	CS306	Mini Project-1	2	0	0	4		100	100		
		Total	22	18	0	08	460	440	900		

#### FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

#### CSE – VI Semester

S No	Course		Cuadita	Sci Ins peri	heme of truction ods/wee	î n ek	Sche M	me of Examina Iaximum Mark	tion s
5. NU	No.	Course Title	Creans	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks
Ι		<b>Theory</b>							
1.	CS315	Machine Learning	3	3	0	0	60	40	100
2.	CS317	Compiler Design	3	3	0	0	60	40	100
3.	CS319	Mobile Computing	3	3	0	0	60	40	100
4.		<b>Professional Elective-2</b>	3	3	0	0	60	40	100
5.		<b>Professional Elective-3</b>	3	3	0	0	60	40	100
6.		<b>Open Elective-2</b>	3	3	0	0	60	40	100
Π		Practical							
7.	CS316	Machine Learning Lab	1	0	0	2	50	50	100
8.	CS318	Compiler Design Lab	1	0	0	2	50	50	100
		Total	20	18	00	04	460	340	800

Scheme: 2017

**Scheme: 2017** 

# INTRODUCTION TO MICROPROCESSORS & MICROCONTROLLERS (IMMC)

Course Code         Course Category         Hours/Week         Credits         Maximum Marks           EC313         Program Core         I         T         P         C         Internal Assessment         End Exam         TOTAL Assessment           COI:         Understand the off         0         0         3         40         60         100           Sessional Exam Duration : 2 Hrs         End Exam Duration: 3 Hrs         End Exam Duration: 3 Hrs         COI:         Understand the operations and internation of 8086 microprocessor.         COI:         COI:         Understand the operations and internation of 8086 microprocessor.         COI:         COI:         COI:         Construme off the course chitecture and operations of 8051 microontroller.         COI:         COI:         COI:         Constempore         Sole         Sole         Sole         Sole         Maximum Marks           COI:         Understand the pin structure, architecture and operations of 8051 microontroller.         COI:         COI:         COI:         Constempore         Sole         Sole         Sole         Sole         Sole         COI:         COI: </th <th>V Semester : C</th> <th colspan="11">V Semester : CSE Scheme : 2017</th>	V Semester : C	V Semester : CSE Scheme : 2017										
EC313         Program Core         L         T         P         C         Continuous Internal Assessment         End Exam         TOTAL           Sessional Exam Duration : 2 Hrs         End Exam Duration: 3 Hrs         End Exam Duration: 3 Hrs         End Exam Duration: 3 Hrs           Course Outcomes : A the end of the course the student will be able to         End Exam Duration: 3 Hrs         End Exam Duration: 3 Hrs           CO2: Understand the pin structure, architecture of 8086 microprocessor.         CO3: Apply the programming model of 8086 microprocessor.         CO3: Apply the programming model of 8086 microprocessor.         CO3: Apply the programming model of 8086 microprocessor.         CO5: Apply the programming model of 8086 microprocessor.         CO5: Apply the programming model of 80851 micro-notrollerfor Assembly language programs.         UNIT I           Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.         8086 CPU architecture, Pin Diagram of 8086 microprocessor.         8086 CPU architecture, Pin Diagram of 8086 microprocessors.           WITT II         Basics of Microprocessors: Comparison of 8085 microprocessors.         UNIT II           8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT IV           Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching.         Searching.           Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circu	<b>Course Code</b>	Course Category	Hou	irs/Wee	ek	Credits	Maxi	mum Marks				
Image: Sessional Exam Duration : 2 Hrs       End Exam Duration : 3 Hrs         Course Outcomes : At the end of the course the student will be able to       CO1: Understand the operations and internal block description 1 of 8086 microprocessor.         CO2: Understand the operations and internal block description 1 of 8086 microprocessor.       CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.       CO5: Apply the programming model of 8051 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, 8085 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.         UNIT I       Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.         UNIT II       8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT III       Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching, Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).         UNIT IV       Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         External memory, counters and Timers, Serial data input/output, interrupts.       Sof1 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         Text B	EC313	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
Sessional Exam Duration : 2 Hrs       End Exam Duration : 3 Hrs         Course Outcomes : At the end of the course the student will be able to       CO1: Understand the pin structure, architecture of 8086 microprocessor.         CO2: Understand the pin structure, architecture and operations of 8086 microprocessor.       CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.       CO5: Apply the programming model of 8051 microcontroller.         CO5: Apply the programming model of 8051 microcontroller.       UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.       UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.       UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set       UNIT III         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching. Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).       VINIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.       External memory, controlsense, Serial data input/output, interrupts.         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.       Introductio	~		3	0	0	3	40	60	100			
Course Outcomes : At the end of the course the student will be able to         CO1: Understand the pin structure, architecture of 8086 microprocessor.         CO2: Understand the operations and internal block description 1 of 8086 microprocessor.         CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.         CO5: Apply the programming model of 8051 microcontroller of Assembly language programs.         UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.         UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT III         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching. Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT-V	Sessional Ex	am Duration : 2	Hrs				End Exa	m Duration: 3	8 Hrs			
CO1: Understand the pin structure, architecture of 8086 microprocessor.         CO2: Understand the operations and internal block description 1 of 8086 microprocessor.         CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.         CO5: Apply the programming model of 8051 microcontroller for Assembly language programs.         UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.         UNIT I         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT II         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching. Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT -V         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         1 <td>Course Outco</td> <td>omes : At the end</td> <td>of the c</td> <td>ourse th</td> <td>ne stu</td> <td>dent will b</td> <td>e able to</td> <td></td> <td></td>	Course Outco	omes : At the end	of the c	ourse th	ne stu	dent will b	e able to					
CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.         CO5: Apply the programming model of 8051microontroller for Assembly language programs.         UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.         UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT III         Programming model of 8085: Simple programs on Arithmetic operations, Sorting, Searching. Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT -V         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         Text Books :         1. A K Ray, K M Bhurchandi, Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.       2. Mazidi Muhammad Ali, Mazidi Janice Gilles	COI: Unders	stand the pin struc	ture, ard	<u>chitectu</u>	re of	8086 micro	oprocessor.					
CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.         CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.         CO5: Apply the programming model of 8051 microprocessor for Assembly language programs.         UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.         UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT II         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching, Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT IV         Interfacing USD         UNIT -V         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         Text Books :         1. A K Ray, K M Bhurchandi, Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGra	CO2: Under	stand the operatio	ons and 1	nternal	block	descriptio	on I of 8086 microp	rocessor.				
CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.         CO5: Apply the programming model of 8051 microcontroller for Assembly language programs.         UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessors.         UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT III         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching, Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT -V         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         1. A K Ray, K M Bhurchandi, Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.         2. Mazidi Muhammad Ali, Mazidi Janice Gillespie & McKinlay Rolin D, The 8051 Microcontroller and Embedded Systems, 2nd Edition, Pearson Education, 2008. <td cols<="" td=""><td>CO3: Apply</td><td>the programming</td><td>model c</td><td>of 8086</td><td>micro</td><td>processor</td><td>for Assembly lang</td><td>uage programs</td><td>•</td></td>	<td>CO3: Apply</td> <td>the programming</td> <td>model c</td> <td>of 8086</td> <td>micro</td> <td>processor</td> <td>for Assembly lang</td> <td>uage programs</td> <td>•</td>	CO3: Apply	the programming	model c	of 8086	micro	processor	for Assembly lang	uage programs	•		
UNIT I         Basics of Microprocessors: Block Diagram and Features of 8085 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.         UNIT II         8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set         UNIT III         Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching, Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).         UNIT IV         Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.         UNIT -V         8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.         Text Books :         1. A K Ray, K M Bhurchandi, Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.         2. Mazidi Muhammad Ali, Mazidi Janice Gillespie & McKinlay Rolin D, The 8051 Microcontroller and Embedded Systems, 2nd Edition, Pearson Education, 2008.         Reference Books :         1. John Uffenbeck, The 8086/8088 Family: Design, Programming, and Interfacing, 3rd Edition, Pearson Ed, 2006.	CO4: Unders	tand the pin struc	ture, arc	hitectui	re and	l operation	s of 8051 microcon	itroller.				
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<ol> <li>A K Ray, K M Bhurchandi, <i>Advanced Microprocessors and Peripherals</i>, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.</li> <li>Mazidi Muhammad Ali, Mazidi Janice Gillespie &amp; McKinlay Rolin D, <i>The 8051 Microcontroller</i> <i>and Embedded Systems</i>, 2nd Edition, Pearson Education, 2008.</li> <li>Reference Books :         <ol> <li>John Uffenbeck, <i>The 8086/8088 Family: Design, Programming, and Interfacing</i>, 3rd Edition, Pearson Ed, 2006.</li> </ol> </li> </ol>	<b>Text Books :</b>											
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1. John Uffenbeck, <i>The 8086/8088 Family: Design, Programming, and Interfacing</i> , 3rd Edition, Pearson Ed, 2006.	Reference Books :											
	<i>1.</i> John Uff Pearson	enbeck, <i>The 8086</i> Ed, 2006.	5/8088 F	Family:	Desig	gn, Progra	mming, and Interfa	cing, 3rd Editi	on,			
2. Barry B. Brey, <i>The Intel Microprocessors-Architecture, Programming and Interfacing</i> , 8th Edition, Princeton Hall India, 2009.												
3. Kenneth J. Ayala, <i>The 8051 Microcontroller</i> , Penram International Publication Ltd, 2006.	3. Kenneth	J. Ayala, The 803	51 Micro	ocontro	ller, F	Penram Inte	ernational Publicati	ion Ltd, 2006.				

- **4.** Gaonkar Ramesh, *Microprocessors Architecture, Programming & Applications with 8085/8080A*, 5th Edition, Penram International Publication Ltd, 2010.
- 5. N. Senthil Kumar, M. Saravanan, S. Jeevananthan, *Microprocessors and Interfacing*, OUP India, 2012.

### Web References:

1. www.nptel.onlinecourseac.in/.microprocessorsandmicrocontrollers

#### **Question Paper Pattern:**

#### **Sessional Exam:**

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

### **End Exam:**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

### DATA MINING (DMG)

V Semester: F	B.Tech-CSE						Sch	neme: 2017		
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS301	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	V Semester:       B.Tech-CSE       Scheme:       2017         Course Code       Category       Hours/Week       Credits       Maximum Marks         CS301       Program Core       L       T       P       C       Internal Assessment       End Exam       TOTAL         Sessional Exam Duration:       2 Hrs       End Exam       TOTAL       Sessional Exam Duration:       3       0       0       3       40       60       100         Sessional Exam Duration:       2 Hrs       End Exam       TOTAL       Sessional Exam Duration:       3 Hrs.         Course Outcomes:       At the end of the course students will be able to       60       100         CO2:       Organize and Prepare the data needed for data mining using pre-processing techniques.       CO3:       Understand data mining classification technique using classifiers.       CO4:       Implement Market based analysis using association rule mining       CO5:       Analyze unsupervised clustering mining algorithms.       UNIT-1       Inta Mining:       Introduction, What is Data Mining, Motivating Challenges, Data Mining Tasks, Types of Data, Similarity d Dissimilarity between Simple Attributes and Data Objects.       UNIT- II       Integration and ansformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.         UNIT - III <td a="" building="" cobsciton="" decision="" expre<="" for="" methods="" td="" tree,=""></td>									
Sessional Ex	am Duration: 2	Hrs				End	Exam Duration	n:3 Hrs.		
		0.1				1.1				
Course Outco	omes: At the end	of the	cours	e stude	ents will be	able to				
COI: Under	stand the importa	nce of	t data r	nining	g and the print	nciples of busir	ness intelligence	·		
CO2: Organ	ize and Prepare ti	ne dat	a need	ed for	data mining	using pre-proc	essing techniqu	les.		
CO3: Under	stand data mining	g class	<u>sitications</u>	on tecl	hnique using	g classifiers.				
CO4: Implei	ment Market base	d ana	lysis u	sing as	ssociation ru	ile mining				
CO5: Analy	ze unsupervised of	cluster	ing mi	ning a	lgorithms.					
				TIN						
				UN	11-1					
<i>Data Mining:</i> ntroduction, What is Data Mining, Motivating Challenges, Data Mining Tasks, Types of Data, Similarity and Dissimilarity between Simple Attributes and Data Objects.										
-	_			UN	IT–II					
Data Preprocess Why Pre-proces Transformation,	<i>ing:</i> s the Data?, De Data Reduction, I	escrip Data I	tive D Discret	Data S izatior	ummarization and Conce	on, Data Clea pt Hierarchy G	ning, Data Int eneration.	egration and		
				UN	III – III					
<i>Classification:</i> Basic Concepts, Decision Tree, E selecting the bes Bayes Theorem,	General Approact Building a decision t split, Algorithn using the Bayes t	h to so on tree n for heore	olving a e, meth Decisio m for c	a class ods fo on Tre classif	ification pro or expressin e Induction ication, Naiv	oblem, Decisior g an attribute t , Rule Base, N ve Bayes Classi	n Tree Induction test conditions, learest-Neighbo ifier.	a: Working of measures for our Classifier,		
				UN	IT– IV					
Association And Basic Concepts Candidate Gener example, FP-Gro	<i>ulysis:</i> and Algorithms: ation and Pruning wth Algorithm.	Frequ g, Rul	ient Ite e Gene	em Set tration	generation, Confidence	, The Apriori F e-Based Prunin	Principle, Aprio g, Rule Generat	ri Algorithm, ion with an		

Cluster Analysis:

What is Cluster Analysis, Types of Clustering, K-Means Algorithm, Agglomerative Hierarchical Clustering Algorithm, Key Issues in Hierarchical Clustering, DBSCAN Algorithm.

**Text Books :** 

1. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, PEA

Data Mining concepts and Techniques, 3/e, Jiawei Han, Michel Kamber, Elsevier, 2006 2.

# **Reference Books :**

- 1. Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH.
- 2. Data Mining Techniques, Arun K Pujari, Universities Press.

## Web References:

- 1. https://onlinecourses.nptel.ac.in/noc18\_cs14/
- 2. https://freevideolectures.com/course/3758/databases-data-mining

# **Question Paper Pattern:**

# Sessional Exam

The question paper for sessional examination is for 40 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# FORMAL LANGUAGES AND AUTOMATA THEORY (FLAT)

V Semester:	V Semester: B.Tech-CSE Scheme: 2017											
<b>Course Code</b>	Category	Hou	rs/W	eek	Credits	Maxim	um Marks					
CS303	Program Core	L 3	T	P	C 3	Continuous Internal Assessment 40	End Exam	TOTAL				
Sessional F	xam Duration	:2 Hr	s	U		End Exa	m Duration:3 F	Irs				
			5									
Course Out	comes: At the	end o	f the c	course	students v	vill be able to						
CO1: Desig	n the finite aut	omata	for a	given	regular la	nguage.						
CO2: Unde	<b>CO2:</b> Understand the regular expressions and pumping lemma of regular languages.											
CO3: Understand the regular grammar, context free grammar and pumping lemma for CFL.												
<b>CO4:</b> Design push down automata and context free grammar for a given context free language.												
CO5: Design the Turing machine for the given formal language.												
					UNIT–I							
<b>Finite Automata preliminaries:</b> Strings, Alphabet, Language Operations, Finite State Machine definitions, Finite Automation Model, Acceptance of strings and languages, Non-deterministic Finite Automation, Equivalence between NFA and DFA, conversion of NFA into DFA, Equivalence between two FSM's, Minimization of FSM, Moore and Mealy machines, Applications of FA's.												
UNIT– II												
<b>Regular Exp</b> Manipulation lemma for RE	<b>Regular Expressions and Regular Sets:</b> Regular sets, Regular expressions, Identity rules, Manipulation of regular expression, Equivalence between RE and FA, Inter conversion, Pumping lemma for RE, Closure properties of regular sets.											
				U	NIT-III							
Grammar For between regular most and left m Context Free ( Normal Form, (	malism: Regul r linear gramma ost derivation of Grammar: Con Griebach Norm	ar Gra ar and of strin text F al For	amma FA, i ngs. Tree G m, pu	r-Righ nter-c ramm ımpinş	nt linear gra onversion ar, Ambigu g lemma of	ammar and left line between RE and R iity in CFG, minim CFL.	ear grammar, Equ G, Derivation tre ization of CFG, (	iivalence es, Right Chomsky				
				U	NIT– IV							
<b>Push Down Automata:</b> Definition of the Pushdown Automaton, A Graphical Notation for PDA's, Instantaneous Descriptions of a PDA, The Languages of a PDA, Acceptance by Final State, Acceptance by Empty Stack, Equivalence of PDA's and CFG's, Properties of Context Free Languages.												
UNIT– V												
<b>Turing Machines:</b> Introduction to Turing Machines, Notation for the Turing Machine, Instantaneous Descriptions for the Turing Machines, Transition Diagrams for Turing Machines, The Language of a Turing Machine, Universal Turing machine, Halting problem of Turing Machine.												

### **Text Books:**

- 1. J.E.Hopcroft, Rajeev Motwani and J.D.Ullman, Introduction to Automata Theory Languages and Computation, Third edition, 2007, Pearson Education.
- 2. Mishra and Chandrashakaran, [2008], [Third Edition], Theory of computer sciences: Automata languages and computation, Third Edition, 2008, PHI.

### **Reference Books:**

- 1. John C Martin, Introduction to languages and the theory of computation, Third edition, 2007, TMH.
- 2. Peter Linz, An Introduction to Formal Languages and Automata, Fourth edition, 2010, Narosa Book Distributors Pvt. Ltd.
- 3. Michael Sipser, Introduction to Theory of Computation, 3rd Edition, 2012, Cengage Learning.
- 4. Bernar M Moret, The Theory of Computation, First edition, 2002, Pearson Education.

### Web References:

1. https://nptel.ac.in/courses/111103016/

2. https://www.tutorialspoint.com/automata\_theory/

# Question Paper Pattern:

### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

Note: JFLAP software is used to design the models of DFA, NFA, Moore machine, Mealy machine, PDA and TM.

# WEB TECHNOLOGIES (WT)

V Semester: B	Semester: B.Tech-CSE Scheme: 2017									
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS304	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2 l	Irs				End E	xam Duration:	3 Hrs		
Course Outco	omes: At the end	of the	e cours	e stude	ents will be	able to				
CO1: Design	a Web Page usin	ig Tex	t Form	natting	Tags, Hype	erlinks.				
CO2: Develo	p a webpage with	Image	es, Tabl	es						
CO3: Unders	stand the concepts	s of C	SS, Lis	sts.						
CO4: Design	n a web page usir	ıg Fra	mes, d	ynami	c web pages	s using JavaScr	ipt			
CO5: Design	a Form using H	[ML]	Forms	& Cor	ntrols.					
CO6: Under	stand the concept	ts of Y	KML.							
UNIT– I										
<i>HTML5:</i> Overview of HTML5 and other web technologies, HTML5 and its essentials, Fundamentals of HTML5, Working with Text and organizing Text in HTML, Working with Links and URLs.										
				UNI	T–II					
<i>Images:</i> Workin <i>CSS:</i> Overview Table Layouts.	ng with Images, I of CSS, Backgro	mage ounds	Maps, and Co	Creat	ing Tables. radients in C	CSS, Fonts and	Text Styles, Lis	t Styles,		
				UNI	T– III					
<i>Frames</i> : Creating Frames using CSS, Displaying Positioning and Floating an Element using CSS. <i>JavaScript</i> : Overview of java script, Functions, Events, Java script Objects, Working with Browser Objects, Document Object, Document Object Model, Validation, Errors, Exception Handling in JavaScript.										
UNIT– IV										
<i>Forms:</i> What's a Form? What Controls are available? Creating a Form and adding HTML Controls, Submitting Data from forms, Customizing Controls in CSS.										
				UNI	T– V					
Working with E Structure of XM	Basics of XML: C	Compa xplori	aring X ng XM	ML w IL par	ith HTML, sers, Descri	Advantages an bing DTD and	d Disadvantage XML Schemas.	s of XML,		

### **Text Books:**

1. HTML5 Black Book,2<sup>nd</sup> Edition, Dreamtech Press,2016.

### **Reference Books:**

- 1. Robert Pattinson, Beginners Guide for HTML and CSS Web Design and Web Development, 2018
- 2. John P. Rhynes, HTML5 and CSS3 The Basics, Introduction for Beginners, 2018.
- 3. Ikram-Hawramani, HTML & CSS for Complete Beginners: A Step by Step Guide to Learning HTML5 and CSS3, 2018
- 4. John Dean, Web Programming with HTML5, CSS, and JavaScript ,2018

### Web References:

- 1. https://www.w3schools.com/Html
- 2. https://www.tutorialspoint.com/Html/index.htm

## **Question Paper Pattern:**

## Sessional Exam

The question paper for session examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

### Note:

1. Tools like Adobe Dreamweaver, Bootstrap can be used to create and manage websites.

# DATA MINING LAB (DMG(P))

V Semester: B.Tech-CS	SE					Scher	me: 2017				
<b>Course Code</b>	Hours/	Week		Credits	Max	imum Marks					
CS302	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL				
	0	0	2	1	50	50	100				
Sessional Exam Dura	ation: 2H	l <b>rs.</b>			En	d Exam Dura	tion: 3 Hrs				
Course Outcomes: At	the end of	of the c	ourse st	udents wil	l be able to						
COI: Learn to execut	e data mi	ning tas	sks usin	ig a data m	ining toolkit WE	<u>KA.</u>					
CO2: Analyze Data p	reprocess	ing tech	hniques	on raw in	put data and proc	ess it for minin	lg.				
CO3: Demonstrate the	ing of alc	ation to	a for do	to mining	talasels.	voiation rula					
mining cluster	ing of alg	çorrunn	s for ua	ta mining (	lasks such as asso						
inining, clustering.											
	List of Experiments										
1. Introduction to WEK	A and cr	eate an	arff dat	taset.							
2. Create a Weather Tal	ble with t	he help	of Dat	a Mining T	ool WEKA.						
3. Demonstration of pre	eprocessii	ng tech	iniques	to the train	ing data set of W	eather Table.					
4. Write a Procedure to	Normaliz	ze Wea	ther Ta	ble data us	ing Knowledge F	low.					
5. Demonstrate Constru	iction of	Decisio	on Tree	for Weath	er data and classi	fy it.					
6. Write a procedure for	r Visualiz	zation o	of Weat	her Table.							
7. Write a procedure in	finding A	Associa	tion Ru	les for Buy	ving Data.						
8. Demonstration of As	sociation	rule pr	ocess o	n dataset te	est.arff using apri	ori algorithm.					
9. Write a procedure for Clustering Customer data using Simple K-Means Algorithm.											
10. Write a procedure for Employee data using Make Density Based Cluster Algorithm.											
Defenses											
<b>Neterences:</b>	Mininal	Dona N	ing Tar	Michael	Stainhach Vinin	Vumor Doorse					
1. Introduction to Data	to ac ng <sup>1</sup>	rang-N	mg ran	i, wiichael	Steinbach, vipin	Kumar, Pearso	011				
2. http://www.cs.walka	no.ac.mz/	III/Wek	.a/								

# ALGORITHMS AND COMPUTER NETWORKS LAB (ACN(P))

V Semester: B.Tech- C	SE					Sche	me: 2017					
<b>Course Code</b>	Hours/	Week		Credits	Max	imum Marks						
CS305	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL					
	0	0	2	1	50	50	100					
Sessional Exam Dura	ation:2 H	rs			E	nd Exam Dura	ation:3 Hrs					
Course Outcomes: At	the end of	of the c	ourse st	udents wil	l be able to							
CO1: Implement divide and conquer techniques.												
CO2: Implement gree	dy metho	d.										
CO3: Implement dynamic programming and graph traversal techniques.												
CO4: Implement the techniques used in data link layer.												
<b>CO5:</b> Implement the r	CO5: Implement the routing algorithms.											
			List of I	Experimen	ots							
1. Merge sort using div	vide and c	onquer										
2.Binary search using di	vide and	conque	er									
3. Prim's algorithm usi	ng greed	y metho	od									
4. 0/1 knapsack problem	m using d	lynamio	c progra	amming								
5. Depth first search												
6. Cyclic Redundancy	Code											
7. Dijkstra's algorithm												
8.Distance vector routi	ng algorit	hm										
9.Link state routing												
10.Domain name serve	10.Domain name server											
Reference Books:												
1. Behrouz A. Forouzan	1. Behrouz A. Forouzan [2006] [4th Edition], Data communications and Networking, MGH.											
2. Andrew S. Tenenbaur	n [2007],	[4th E	dition],	Computer	Networks, Pearso	on Education.						

## MACHINE LEARNING (ML)

VI Semester:	B.Tech-CSE						Sche	me: 2017		
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS311	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2 l	Hrs				Maximum Marks         Continuous Internal Assessment       End Exam       TOTAI         Assessment       60       100         End Exam Duration:3 Hrs       End Exam Duration:3 Hrs         e able to       ain steps in a typical machine learning         orm equation and Gradient Descent egression model.       Feature         ector Machines, Decision trees and CART       pasting, random forests, dimensionality ng algorithms-k-Means, DB Scan         s, Testing and Validating       fitor and Maintain your system         s, Multiclass classification, Error analys         on, Learning Curves, Regularized Line         A Regression         ns, Estimating class probabilities, CAF		3 Hrs		
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to	• 1 1• 1	•		
col: Unders	stand the machine	learn	ing co	ncepts	and the ma	in steps in a typ	oical machine le	arning		
CO2. Build a	digit image classi	fier or	MNIS	T data	icot					
CO3: Build a	linear regression	n mod	el usin	σ dire	ct closed for	m equation and	Gradient Desc	ent		
approa	ches, polynomial	regre	ssion r	nodel,	softmax reg	ression model.		ont		
CO4: Under	tand the core cone	onto o	ndwor	lingo	F Support Vo	otor Maahinaa 1	Desision trass on	ACADT		
training algorithm.										
<b>CO5:</b> Understand popular ensemble methods-bagging and pasting, random forests, dimensionality										
reduct	ion techniques-P	CA, K	lernel l	PCA a	nd clusterin	g algorithms-k-	Means, DB Sca	in		
				UN	IT–I					
Machine Learning Landscape										
Introduction, Types of Machine Learning Systems, Challenges, Testing and Validating										
End-to-End Machine Learning Project										
Working with Re	Working with Real data, Look at the big picture, Launch, Monitor and Maintain your system									
				UNI	T–II					
Classification										
MNIST, Trainin	g a Binary Class	sifier,	Perfor	mance	e measures,	Multiclass cla	ssification, Erro	or analysis,		
Multilabel classi	fication, Multiou	tput cl	lassific	ation						
				UNI	Т– Ш					
Training Models	5			0111						
Linear Regressi	on, Gradient De	scent.	Poly	nomial	Regression	n, Learning C	urves, Regulari	zed Linear		
Models, Logistic	Regression		J		0	, 6 -				
, 8	6			UNI	T_ IV					
Support Vector	Machines									
Linear SVM clas	sification. Nonlin	iear S	VM cl	assific	ation. SVM	Regression				
Decision Trees	,				···· , ··· ,	8				
Training and vi	sualizing a decis	sion t	ree. N	laking	prediction	s. Estimating	class probabilit	ies. CART		
Training algorit	hm. Computatio	onal d	comple	exity.	Gini Impu	rity or Entroi	ov. Regularizat	ion Hyper		
parameters. Reg	ression			, ,	onn mp#		, <u> </u>			
F				TINI	TV					
Ensemble Learn	ing and Random	Fore	ests	UN	<u>11- v</u>					
Voting classifiers, Bagging and pasting, Random patches and Random subspaces, Random forests										
Dimensionality	Reduction		, i cuita	om pu	terres und IX	andom subspue	co, realization 1010	-500		
Curse of dimensi	ionality. Main an	proact	nes for	Dime	nsionality R	eduction. PCA	Kernel PCA			
Unsupervised I	earning Technia			21110			,			
S nouper riseu La										

Clustering algorithms - K-Means, DB Scan

### **Text Books:**

1. Aurelian Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to build Intelligent Systems", OReilly Publications, First Edition, 2017

2. Tom M.Mitchell, "Machine Learning", Mc Graw Hill Education, Indian Edition, 2013

### **Reference Books:**

1. Oliver Theobald, "Machine Learning for Absolute Beginners", Second Edition, 2017

### 2. Ethem Alpaydin," Introduction to Machine Learning", The MITPress, Third Edition, 2014

3. Miroslav Kubat, "An Introduction to Machine Learning", Springer, 2017

### Web References:

- 1. <u>https://www.coursera.org/learn/python-machine-learning</u> offered by University of Michigan
- 2. <u>https://scikit-learn.org/stable/</u>

3. https://github.com/ageron/handson-ml.

4. <u>https://www.coursera.org/learn/python-data-analysis?specialization=data-science-python</u>

5. https://www.coursera.org/learn/python-plotting?specialization=data-science-python

6. http://learnpython.org/

### **Question Paper Pattern:**

### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e. there will be two questions from each unit and the student should answer any one question.

## **COMPILER DESIGN (CD)**

VI Semester:	VI Semester: B.Tech-CSE Scheme: 2017									
Course Code	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
					CT CT CT	Continuous				
00212		L	Т	Р	С	Internal	End Exam	TOTAL		
C\$313	Program Core		-		C	Assessment				
		3	0	0	3		60	100		
Sessional Ex	am Duration:21	Hrs	0	U	5	End F	xam Duration:	3 Hrs		
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to				
CO1: Unders	stand the phases of	of com	piler a	nd con	npiler const	ruction tools.				
CO2: Identify	y tokens in the sou	rce pro	ogram	using l	exical analyz	er technique.				
CO3: Develo	op top-down and	oottor	n-up p	arsers	for the give	n grammar.				
CO4: Develo	<b>CO4:</b> Develop type checking semantic rules using synthesized and inherited attributes.									
<b>CO5:</b> Develop optimized intermediate code using code optimization techniques.										
CO6: Under	<b>CO6:</b> Understand target code generation using flow graph and DAG representations of input source									
code.										
UNIT– I										
Compilers:										
<i>Compilers:</i> Basic function of Language translator, differences between compiler and interpreter, bootstrapping.										
Basic function of Language translator, differences between compiler and interpreter, bootstrapping, logical phases of a compiler, differences between pass and phase, grouping the phases into passes.										
compiler construction tools.										
Lexical Analys	is:									
The role of lexical analyzer, input buffering, specifications of tokens, recognition of tokens, a language										
for specifying l	exical analyzers,	LEX t	cool.	1				00		
1 7 0	<b>,</b>									
				UNI	T–II					
Syntax Analysi	s:									
Role of parser,	top down parsing	, recu	rsive d	ecent	parsing, pred	dictive parsers,	non-recursive p	oredictive		
parsing, bottom	up parsing, operation	ator p	recede	nce pa	rsing, LR pa	arsers, using an	nbiguous gramn	nars,		
YACC parser g	enerator.									
				UNI	T– III					
Semantic Analy	ysis:									
Typical semant	ic errors, type che	cking	, type	conve	rsions, speci	fication of a sin	mple type check	ter,		
equivalence of	type expressions,	overl	oading	of fur	nctions and o	operators, polyi	morphic functio	ns,		
strategies of sto	rage allocation: s	tatic,	dynam	ic and	heap.					
Syntax-Directe	d Translation:									
Syntax-Directed	d Definitions, Con	nstruc	tion of	Synta	x Trees, Bo	ttom-Up Evalu	ation of S-Attri	buted		
Definitions, L-A	Attributed Definit	ions, '	Top D	own T	ranslation, H	Bottom-Up Eva	luation of Inher	ited		
Attributes.										
UNIT– IV										
Intermediate Code Generation:										
Intermediate co	de languages, thre	e addı	ress coo	de, typ	es of three a	ddress code, syı	ntax directed tran	nslation		
into three addres	ss code, implemen	tation	s of the	ree ado	lress stateme	ents - quadruple	s, triples, indired	et triples,		
Boolean express	sions, back patching	ıg.					-	-		
Code Optimizat	Code Optimization:									
Introduction to code optimization, principles sources of optimization, optimization of basic blocks,										
peephole optim	ization.									
				UN	[ <b>T</b> – <b>V</b>					
Code Generation	on:									

Issues in the design of code generator, the target machine, basic blocks and flow graphs, next use information, a simple code generator, DAG representation of basic blocks, generating code from DAGs.

#### **Text Books :**

1. Alfred V.Aho, Ravi Sethi, Jeffrey and D.Ullman, Compilers Principles, Techniques and tools, Pearson edition, 2014

#### **Reference Books :**

1. KVN Sunitha, Compiler Construction, Pearson, 2013.

2. Keith D Cooper & Linda Torczon, Engineering a Compiler, Second Edition, MK (Morgan Kaufmann), Elsevier, 2008.

- 3. Parag H Dave, Himanshu B Dave, Compiler Principles and Practice, Pearson, 2012.
- 4. Sandeep Saxena, Rajkumar Singh Rathore, Compiler Design, S Chand Publications, 2013.

### Web References:

- 1. https://nptel.ac.in/courses/106104072/
- 2. https://www.geeksforgeeks.org/compiler-design-tutorials/
- 3. https://www.tutorialspoint.com/compiler\_design/
- 4. https://www.javatpoint.com/compiler-tutorial

### **Question Paper Pattern:**

### **Sessional Exam:**

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

### Note:

1. The modern tool "Flex" can be used to demonstrate Lex and YACC topics in UNIT-1 and UNIT-2 respectively.

# **MOBILE COMPUTING (MCP)**

\_\_\_\_\_

VI Semester:	B.Tech-CSE						Sche	me: 2017
CourseCode	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks	
CS315	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Ex	am Duration:2 I	Irs				End E	xam Duration:	3 Hrs
Course Outco	omes: At the end	of the	e cours	<u>e stud</u>	ents will be	able to		
CO1: Under	stand the basic co	oncep	ts of w	ireless	s communica	ation & mobile	computing.	
CO2: Under	stand the WI AN	s med	1um ac	cess c	ontrolling m	lechanisms and	USM.	
CO4: Acqui	ring knowledge o	<u>Syste</u>	etructi	initecti	ure, Protoco	Mobile IP	Physical Layer.	
CO4. Acqui	ning kilowledge o	$\frac{11 \text{ ulc}}{2 \text{ mol } T}$	$\frac{SHUCH}{CD}$ or	$\frac{10 \times 10}{100}$		vomente of TCI		
	stand the Traditio	Jilai I	CP and	u Clas	sical improv	venients of TCF		
				UN	IT_I			
Wireless transı Multiplexing, M	nission: Frequen odulation (ASK, 1	icies FSK,	for rad PSK) S	dio tra Spread UNI	ansmission,   spectrum, ( <mark>[- II</mark>	Signals, Ante Cellular system	ennas, Signal p Is.	ropagation,
Medium access classical Aloha, GSM: Mobile Handover	<b>control</b> : Motiva Slotted Aloha, CS services, System	ation SMA) Arcl	for a \$ , CDM hitectu	Specia [A, Co re, Ra	lized MAC mparison of adio interfa	, SDMA, FDM S/T/F/CDMA ce, Protocols,	ЛА, TDMA (Fi Localization a	ixed TDM, and calling,
				TINIT				
				UNII	- 111			
Wireless LAN: 1	Infrared Vs Radic	) Tran	smissi	on, Inf	fra Red and	ad-hoc network	ζ,	
IEEE 802.11: S MAC manageme	System architectu ent.	re, Pr	otocol	archit	ecture, Phy	sical layer, Me	dium access co	ontrol layer,
				UNIT	Γ <b>– ΙV</b>			
<b>Mobile IP</b> : Goal Registration, Tu Configuration pr	s & requirements innelling & Enc otocol.	, Enti apsul	ties and ation,	d term Optin	inology, IP nizations, F	Packet delivery Reverse tunnel	7, Agent discove ing, IPv6, Dyı	ery, namic host
				UNI	Γ– V			
<b>Traditional TC</b> Classical TCP in	<b>P</b> : Congestion con	ntrol,	Slow s	start, F	ast retransn	nit/fast recovery	y, implications of	of mobility,

### **Text Books :**

1. Jochen Schiller [2008], [Second Edition], Mobile Communications, Low price edition, Pearson

### **Reference Books :**

1. Talukder [2008], Mobile Computing: Technology, Applications & service creation, TMH.

#### Web References:

- 1. https://sgar91.files.wordpress.com/2011/10/mobile\_communications\_schiller\_2e.pdf
- 2. https://www.pearson.com/us/higher-education/program/Schiller-Mobile-Communications-2nd-

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions i.e. there will be two questions from each unit and the student should answer any one question.

# MEACHINE LEARNING LAB (ML(P))

VI Semester: B.Tech- CSE Scheme: 2017										
Course Code	Hours/	Week		Credits	Max	imum Marks				
	-			~	Continuous					
CS312	L	Т	Р	С	Internal	End Exam	TOTAL			
	0	0		1	Assessment	50	100			
	0	0	2	l	50	50	100			
Sessional Exam Dura	ation:2 H	rs			Er	nd Exam Dura	ation:3 Hrs			
		0.1		1						
Course Outcomes: At	the end of	of the co	ourse st	udents will	l be able to					
COI: Build a machine	e learning	g mode	for a g	iven data s	set.					
CO2: Use Scikit-Leai	rn toolkit	for bui	lding m	achine lea	rning models					
				<b>·</b>						
List of Experiments										
1. Scikit-Learn Practice										
2. Build a digit image c	classifier	on MN	IST data	iset.						
3. Build a linear Regr	ession m	odel for	r a give	n data set						
4. Support Vector ma	chines									
5. Training and Visua	alizing a o	decisio	n tree							
6. Ensemble Learning	5									
7. Random Forests										
8. Dimensionality Re	duction 1	Fechnic	lue - PC	CA						
9. Clustering algorithm – k-Means										
Reference Books :										
1. Aurelian Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow : Concepts,										
2. Danish Haroon, "Python Machine Learning Case Studies", Apress										
3. Peter Harrington,	"Machine	e Learn	ing in A	Action", M	anning Publicatio	ons, 2012				

# COMPILER DESIGN LAB (CD(P))

VI Semester: B.Tech-				Sche	me: 2017				
Course Code	Hours/	Week		Credits	Maximum Marks				
					Continuous				
CS314	L	Т	Р	С	Internal	End Exam	TOTAL		
					Assessment				
	0	0	2	1	50	50	100		
Sessional Exam Dura	ation:2 H	[ <b>rs</b>			End	l Exam Durat	ion:3 Hrs		
Course Outcomes: At	the end of	of the co	ourse st	udents will	l be able to				
CO1: Implement DFAs, LA and Parser.									
CO2: Implement Top	Down an	d Botto	om up p	arsing met	hods.				
CO3: Design a Type c	checking	system.							
CO4: Construct DAG, Code generation and Code optimization.									
List of Fun arim onto									
List of Experiments									
1. Implementation of Deterministic finite automata (DFAs).									
2. Implementation of Sy	2. Implementation of Symbol Table.								
5. Lexical analyzer using 4. Vece are grown to use									
4. Yacc program to rec	$\frac{\text{ognize a}}{\text{s of a giv}}$	valid ai	mar	c expressio	on.				
6. Implement Shift red	uce parsi	ng.	iiiiai .						
7. Operator precedence	parsing.	-8							
8. Implement Type che	cking sys	stem.							
9. Stack storage allocat	tion techr	nique.							
10. Construction of Dir	rected Ac	yclic G	raphs(I	DAGs).					
11. Construction of Co	de Gener	ation fr	om Thr	ee Address	s Code.				
12. Implementation of	Code Op	timizati	ion tech	niques.					
		Ad	lditiona	l Experim	ents				
1. Elimination of Left	t Recursio	on of a	Gramm	ar.					
2. Find Left factor of	a Gramn	nar.							
3. Construct a Parse Tree for a String.									
4. Implementation of Non-Recursive predictive parsing.									
5. Construct a parsing table.									
<b>Reference Books :</b>	Reference Books :								
1. Alfred V. Aho, Ray	1. Alfred V. Aho, Ravi Sethi, J.D.Ullman, [2 <sup>nd</sup> Edition], Compilers principles techniques and tools,								
realson Education, 2	007.								

### FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

CSE – VII Semester

S No	Course		Credits -	S Iı pe	cheme nstructio riods/w	of on eek	Scheme of Examination Maximum Marks			
5.110	No.	Course Title	Creatis	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks	
Ι		Theory								
1.	CS401	Network Security and Cryptography	3	3	0	0	60	40	100	
2.	CS403	Big Data Analytics	3	3	0	0	60	40	100	
3.	CS405	Software Project Management	3	3	0	0	60	40	100	
4.		Professional Elective - 4	3	3	0	0	60	40	100	
5.		<b>Open Elective-3</b>	3	3	0	0	60	40	100	
6.		<b>Open Elective-4</b>	3	3	0	0	60	40	100	
II		Practical								
7.	CS402	Network Security and Cryptography Lab	1	0	0	2	50	50	100	
8.	CS404	Big Data Analytics Lab	1	0	0	2	50	50	100	
9.	CS406	Mini Project -2	2			4		100	100	
		Total	22	18	00	08	460	440	900	

## FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination (Effective from 2017-2018)

#### CSE – VIII Semester

Scheme: 2017

S No	S. No Course	Course Title	Credits -	S Iı pe	Scheme nstructi riods/w	of on eek	Scheme of Examination Maximum Marks		
5.110	No.	Course Title	Creatis	L	T/D	Р	End Exam Marks	Internal Assessment Marks	Total Marks
Ι		Theory							
1.		Professional Elective - 5	3	3	0	0	60	40	100
2.		Professional Elective – 6	3	3	0	0	60	40	100
II		Practical							
3.	CS417	Project Work	6	0	0	12	50	50	100
		Total	12	6	0	12	170	130	300
			OR						
Ι	CS426	Internship	6	0	0	0	0	100	100
II.	CS417	Project Work	6	0	0	12	50	50	100
		Total	12	6	0	12	50	150	200

**Scheme: 2017** 

# NETWORK SECURITY AND CRYPTOGRAPHY (NSC)

VII Semester:	VII Semester: B.Tech-CSE Scheme: 2017								
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
CS401	Program Core	L	T	P	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	0	0	3	40	60	100	
Sessional Exam Duration: 2 mrs End Exam Duration: 3 mrs									
Course Outcomes: At the end of the course students will be able to         CO1: Illustrate the concepts and principles of computer network security.         CO2: Understand various classical encryption techniques and block cipher structure.         CO3: Analyze advanced encryption standard.         CO4: Understand block cipher operations.									
CO5: Explai	n various asymm	etric c	inhere						
CO6: Under	stand cryptograph	vic has	h func	rtions :	and digital s	ionatures			
	stand eryptograph		iii iuiic		ind digital s	ignatures.			
				UN	IT–I				
Introduction to Security concepts Computer security concepts, OSI Security Architecture, Security attacks, Security services, Security mechanisms, Fundamental security design principles, A model for Network Security. Number Theory Euclidean Algorithm, Modular Arithmetic, Fermat's and Euler's Theorem, Testing for primality.									
Classical Encry techniques, Steg Block Ciphers of Traditional bloc cipher design p	yption Technique ganography. <i>and DES</i> ck cipher structur rinciples.	es: S <u>y</u> re, Da	ymmet uta Eno	ric cij cryptic	pher model	, Substitution , DES Example	techniques, Tr e, Strength of I	ansposition DES, Block	
				UNI	T– III				
Advanced Encry AES Structure, Block Cipher O Multiple Encry feedback mode.	yption Standard AES transformati peration yption and Triple output feedback	ion fur e DES mode	nctions S, Elec	s, AES ctronic	Key Expan	sion, AES Exar , Cipher Block	nple, AES Imple	ementation. ode, Cipher	
	1			UNI	T– IV				
Asymmetric Cip Public-Key Cry Hellman Key E	Asymmetric Ciphers and Public key cryptosystems Public-Key Cryptography and RSA: Principles of Public-key cryptosystems, RSA Algorithm. Diffie- Hellman Key Exchange, Elgamal Cryptographic systems.								
				UNI	[ <b>T</b> – <b>V</b>				
Cryptographic Applications of Message Authe Requirements, J Digital Signatu Digital Signatu	Hash Functions cryptographic hantication codes: Message authention res re requirements, H	ish fur cation Elgam	nctions functi al Dig	, Hash ons, so ital Sig	functions b ecurity of M gnature, Sch	ased on cipher ACs. norr Digital Sig	block chaining, gnature scheme.	SHA.	

### **Text Books :**

- 1. William Stallings, [7th Edition], Cryptography and Network Security, Pearson.
- 2. Behrouz A. Forouzan, D Mukhopadhayay, [2nd Edition], Cryptography and Network Security, MC Graw Hill

### **Reference Books :**

- Eric Cole, Dr. Ronald Kurtz and James W. Conley, Network Security Bible, Wiley Publishers, 2009
- 2. Bruce C.Berndt, Number Theory in the Spirit of Ramanujanl, University Press
- 3. V.K. Jain, Cryptography and Network Security, Khanna Publishing House.
- 4. Atul Kahate, Cryptography and Network Security, TMH

## **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No.1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER / OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

# **BIG DATA ANALYTICS (BDA)**

VII Semester:	<b>B.Tech CSE</b>				1	Schem	ne: 2017		
<b>Course Code</b>	Category	Ho	Max	imum Marks					
CS403	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	0	-	3	40	60	100	
Sessional Exa	am Duration:	2 Hr	s	1		En	d Exam Durati	on: 3 Hrs	
Course Outcomes: At the end of the course, the students will be able to									
CO1: Underst	tand the basics	of Bi	g Data	ı Analy	ytics,Hado	op.			
CO2: Design	Map Reduce p	brogra	ms for	a give	en problem	•			
CO3: Write P	ig Scripts on F	Hadoo	<u>p that y</u>	works	on large d	atasets.			
CO4: Perform	1 Data Queryin	g Ope	eration	s using	g Apache I	live.			
CO5: Implem	CO5: Implement Data Management using NoSQL Databases.								
UNIT-1 Rig Data Analytics:									
<b>Big Data Analytics:</b> What is Dig Data Analytics, why this Suddon Hung Around Dig Data Analytics? Classification of									
What is big Da	lla Analytics,	wily	tills 5 Fa Date		Top Anal	ound dig Data An etios Tools	alytics? Classif	ication of	
Introduction to	Halleliges Pac	Ing D	Ig Dau	a, rew	Төр Апа	ylles 10015.			
Introducing Had	oon HDFS H	DFS	Comm	ands	Processing	Data with Hadoon	Managing Reso	ources and	
Applications wit	h Hadoop YA	RN, I	nteract	ting wi	ith Hadooj	EcoSystem.	, Munuging Rese	urees and	
	-				UNIT-II				
Understanding	Map Reduce &	& YA	RN:						
The Map Reduce	e Framework (	Conce	ept, De	velopi	ing Simple	Map Reduce App	lication,Points to	o consider	
While Desining	Map Reduce,	YAR	N Bacl	kgrour	nd,YARN	Architecture,Worki	ng of YARN.		
					UNIT– I	I			
Analyzing Data with Pig: Introducing PIG, Running PIG, Getting started with pig Latin, Working with operators in pig, Debugging pig.									
					UNIT-I	7			
Understanding I	HIVE:								
Introducing Hive	e,Hive Service	s, Bui	lt in fu	inctior	ns in Hive,	Hive DDL,Data Ma	anipulation in H	ive.	
					UNIT-V				

# NoSQL Data Management:

Introduction to NoSQL, Characteristics of NoSQL, Types of NoSQL Data Models, Schema-less Databases.

#### **Text Books:**

- 1. Big Data Black Book: Covers Hadoop 2, Map Reduce, Hive, YARN, Pig, R and Data Visualization by DreamTech, 2015.
- 2. Big Data and Analytics by Seema Acharya, Wiley Publication, 2015.

## **Reference Books:**

- 1. Data Science & Big Data Analytics: Discovering, Analyzing, Presenting Data Visualizing.
- 2. Hadoop: The Definitive Guide, 3rd Edition, By Tom White, O'reilly Media
- 3. Big Data Now: 2012 Edition Publisher: O'Reilly Media.
- 4. Too Big to Ignore: The Business Case for Big Data (Wiley and SAS Business Series) By Phil Simon, Wiley 1e.

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8marks each.

### **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub- questions. i.e there will be two questions from each unit and the student should answer any one question

### Note:

- 1. Cloudera environment or Hadoop can be used to demonstrate various Hadoop Ecosystem for all the units.
- 2. Apache Hadoop is open source software for analyzing Big data. This is applicable for UNIT-I.
- 3. Map Reduce Programs are designed for data processing correspondingly in UNIT-II.
- 4. Apache pig is a tool used for data processing applicable for UNIT-III.
- 5. Apache Hive gives SQL like Interface to Query Data in UNIT-IV
- 6. Analysis type of questions can be given for Assignment from UNIT-II and UNIT-III.

## SOFTWARE PROJECT MANAGEMENT (SPM)

VII Semester: B	VII Semester: B.Tech- CSE					Scheme: 2017				
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks				
CS405	Program Core	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Exam Duration: 2 Hrs End Exam Duration: 3 Hrs										
·										
Course Outcor	mes: At the end of	f the c	course,	stude	nts will be a	ble to				
CO1: Define the	he purpose of pro	ject m	anagei	ment a	nd program	me managemen	ıt.			
CO2: Discuss	project planning a	and pr	cocess 1	model	s.					
CO3: Estimate	e effort of softwar	e proj	ect usi	ng eff	ort estimatio	on techniques.				
CO4: Describe	e risk categories a	nd ste	eps to r	nonito	or, control th	e project.				
CO5: Understand the importance of team work and software quality.										
UNIT-I										

**Introduction to Software Project Management:** What is a project, Activities covered by Software Project Management, Plans Methods and Methodologies, Ways of categorizing software projects, Stakeholders, Setting Objectives, The Business Case, Project success and failure, What is Management and Management control, Traditional and Modern Project Management Practices.

**Project Evaluation and Programme Management:** A Business Case, Project Portfolio Management, Evaluation of individual projects, Cost-benefit Evaluation Techniques, Risk Evaluation, Programme Management, Strategic Programme Management, Creating a Programme, Aids to programme management, Benefits Management.

## UNIT-II

An overview of Project Planning: Introduction to Step Wise Project Planning

**Selection of an Appropriate Project Approach:** Choosing Methodologies and Technologies, Software Processes and Process Models, The Waterfall Model, The Spiral Model, Software Prototyping, Incremental Delivery, Rapid Application Development, Agile Methods, Extreme Programming, Scrum, Managing Iterative Processes, Selecting the Most Appropriate Process Model.

### UNIT-III

**Software Effort Estimation:** Introduction, Where are Estimates done, Problems with Over and Under estimates, The basis for Software Estimating, Software Effort Estimation Techniques, Estimation by Analogy, Albrecht Function Point Analysis, Function Points Mark II, COSMIC Full Function Points, COCOMO II: A Parametric Productivity Model, Staffing Pattern, Effect of Schedule Compression, Caper Jones Estimating Rules of Thumb.

### UNIT-IV

**Risk Management:** Risk, Categories of Risk, A Framework for dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Evaluating Risks to the Schedule, Applying the PERT Technique.

**Monitoring and Control:** Creating the Framework, Collecting the Data, Review, Project Termination Review, Visualizing Progress, Cost Monitoring, Earned Value Analysis, Prioritizing Monitoring, Getting the Project Back to Target, Change Control, Software Configuration Management.

### UNIT– V

**Working in Teams:** Introduction, Becoming a Team, Decision Making, Organization and Team Structures, Coordination Dependencies, Dispersed and Virtual Teams, Communication Genres, Communication Plans, Leadership.

**Software Quality:** The place of Software Quality in Project Planning, Importance of Software Quality, Defining Software Quality, ISO 9126, Product and Process Metrics, Product versus Process Quality Management, Quality Management Systems, Process Capability Models, Techniques to help enhance Software Quality.

### **Text Books :**

- 1. Software Project Management, Bob Hughes, Mike Cotterell & Rajib Mall, Fifth edition, Tata McGraw Hill Education (India) Private Limited, 2011.
- 2. Software Project Management, Walker Royce, Pearson Education, 2012.

### **Reference Books :**

- 1. Software Project Management, S.A.Kelkar, Second Edition, PHI, 2011.
- 2. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
- 3. The art of Project Management, Scott Berkun, O'Reilly, 2005.
- 4. Software Project Management in Practice, Pankaj Jalote, Pearson Education, 2002.

### Web References:

- 1. https://www.tutorialspoint.com/software\_engineering/software\_project\_management.htm
- 2. https://en.wikipedia.org/wiki/Software\_project\_management

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examinations for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No. 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question paper contains six questions. Question 1 contains 5 short answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions i.e there will be two questions from each unit and the student should answer any one question.

### Note:

- 1. Give an assignment on how to select the most appropriate process model for a given project from UNIT II.
- 2. Solve problems and give assignment on effort estimation techniques from UNIT-III.
- 3. Form teams and assign small projects to take up as a team from UNIT-V.

# NETWORK SECURITY AND CRYPTOGRAPHY LAB (NSC (P))

VII Semester: B.Tech-	VII Semester: B.Tech-CSE					Sche	me: 2017
Course Code	Hours/	Week		Credits	Max	imum Marks	
CS402	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Dura	ation:2 H	rs			En	d Exam Dura	tion:3 Hrs
Course Outcomes: At the end of the course students will be able to							
CO1: Perform basic concepts from number theory.							
<b>CO2:</b> Implementation of encryption and decryption using substitution techniques.							
<b>CO3:</b> Perform encryption and decryption using transposition techniques.							
<b>CO4:</b> Implementation of encryption and decryption using DES and RSA algorithms.							
CO5: Develop programs for various public key cryptosystems.							
		j	List of I	Experimen	ets		
1. Implementation of bas	sic Euclid	ean alg	orithm.	•			
2. Perform Fermat's prin	nality test	-					
3. Encrypt and decrypt a	message	using (	Caesar o	cipher			
4. Encrypt and decrypt a	message	using I	Hill cip	her			
5. Encrypt & decrypt a n	nessage u	sing Tr	ansposi	ition Ciphe	r		
6. Implementation of DE	S algorit	hm					
7. Implementation of RS	A algorit	hm					
8. Perform Diffie-Hellma	an Key E	xchang	e				
9. Implementation of Elg	gamal Cry	ptogra	phic sy	stem			
<b>Reference Books :</b>							
1. William Stallings, [7	th Edition	n], Cryp	otograp	hy and Net	work Security, Pe	earson.	
2. Behrouz A. Forouzan	, D Mukł	opadha	ayay, [2	and Edition	], Cryptography a	and Network S	ecurity,

MC Graw Hill.

# **BIG DATA ANALYTICS LAB (BDA(P))**

VII Semester: B.Tech-					Sche	me: 2017		
<b>Course Code</b>	Hours/	Week		Credits	Max	Maximum Marks		
CS404	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
	0	0	2	1	50	50	100	
Sessional Exam Dura	ation: 2H	lrs.			En	d Exam Dura	tion:3Hrs	
Course Outcomes: At the end of the course students will be able to								
CO1: Demonstrate Ha	<b>CO1:</b> Demonstrate Hadoop Commands in Ubuntu environment.							
CO2: Design Map Reduce Programs to different problems.								
CO3: Implement Pig on Hadoop Framework and perform basic operations.								
CO4: Perform DDL operations using Hive on Hadoop.								
		j	List of I	Experimen	ts			
1. Perform Hadoop Se	etup in L	ocal and	d Pseud	o mode an	d monitor througl	h Web Based U	JI.	
2. Implementation of	Hadoop	Shell C	omman	ds on files.				
3. Implementation of	word cou	ınt Exa	mple us	ing Hadoo	p Map Reduce.			
4. Write a Map Reduc	e Progra	m that	works c	on Gutenbe	rg data.			
5. Write a Map Reduc	e Progra	m that	mines v	veather dat	a.			
6. Write Pig Latin Sci	ripts on E	Describe	e, for ea	ch and ord	er by operator.			
7. Write Pig Latin scr	ipts to pe	erform s	et and s	sort operati	.on.			
8. Perform DDL Oper	rations or	n Hive.						
9.Implementation of 1	Data Mar	nageme	nt using	g NoSQL E	Databases.			
<b>Reference Books :</b>				1 51		·		
1.Big and Hadoop Le	arn by ex	amples	by Ma	yank Bhus	han, BPB Publica	itions, First Ed	ition ,2018	

# **Open Electives 1**:

S.No	Course	Course Name	Offered by the
	NO.		Department
1.	OE301	Artificial Intelligence & Expert Systems	CSE
2.	OE302	Introduction to Information Systems	CSE
3.	OE303	Web Development Programming	CSE
4.	OE304	Introduction to Cyber Security	CSE
5.	OE305	Internet of Things	ECE
6.	OE306	Nano Technology	ECE
7.	OE307	Remote Sensing & GIS	CE
8.	OE308	Optimization Techniques	ME
9.	OE309	Renewable Energy	EEE
10.	OE310	Introduction to Java	CSE

# **Open Electives 2:**

S No	Course	Course Name	Offered by the
5.110	No.	Course Name	Department
1.	OE311	Object Oriented Programming through JAVA	CSE
2.	OE312	Ethical Hacking	CSE
3.	OE313	Principles of Programming Languages	CSE
4.	OE314	Advanced Information Systems	CSE
5.	OE315	Scientific Programming with Python	CSE
6.	OE316	Fuzzy Logic & Neural Networks	ECE
7.	OE317	Building Information Modeling	CE
8.	OE318	Product Lifecycle Management	ME
9.	OE319	Simulation of Engineering Systems	EEE

# **<u>Open Electives 3:</u>** (Department Emerging Technologies)

S.No	Course No.	Course Name
1.	CS411	Data Science with R
2.	CS412	Internet Protocols
3.	CS413	Dot Net Technologies

# **<u>Open Electives 4:</u>** (Department Emerging Technologies)

S.No	Course No.	Course Name
1.	CS414	Natural Language Processing
2.	CS415	Human Computer Interaction
3.	CS416	Software Quality and Testing

# **Professional Electives-1**

S.No	Course No.	Course Name
1.	CS307	Advanced Computer Architecture
2.	CS308	Artificial Intelligence
3.	CS309	Computer Graphics
4.	CS310	Mobile Application Development

# **Professional Electives-2**

S.No	Course No.	Course Name
1.	CS316	Distributed Systems
2.	CS317	Multimedia and Animation
3.	CS318	Service Oriented Architecture & Web Services
4.	CS319	Pattern Recognition

# **Professional Electives-3**

S.No	Course No.	Course Name
1.	CS320	Design Patterns
2.	CS321	Advanced Database Management Systems
3.	CS322	Soft Computing
4.	CS323	Computer Simulation and Modelling

# **Professional Electives-4**

S.No	Course No.	Course Name
1.	CS407	Ad hoc and Sensor Networks
2.	CS408	Parallel and Distributed Algorithms
3.	CS409	Cloud Computing
4.	CS410	Computer Vision

# **Professional Electives-5**

S.No.	Course No.	Course Name
1.	CS418	Introduction to Block Chain Technologies
2.	CS419	Wireless Networks
3.	CS420	Real Time Systems
4.	CS421	Deep Learning

# **Professional Electives-6**

S.No.	Course No.	Course Name
1.	CS422	Digital Forensics
2.	CS423	High Performance Computing
3.	CS424	Image and Video Processing
4.	CS425	Embedded Systems

	ARTIFICIAL IN	NTEL	LIG	ENCE	& EXPE	RT SYSTEMS	S (AIES)		
V Semester: B.Tech			Scheme: 2017						
<b>Course Code</b>	Category	Hou	rs/W	eek	Credits	Ma	Maximum Marks		
OE301	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	0	0	3	40	60	100	
Sess	Sessional Exam Duration:2 Hrs End Exam Duration:3 Hr							on:3 Hrs	
Course Outco	omes: At the end of t	he co	urse s	studer	nts will be	able to			
CO1: Underst	and how to formulate	e an ef	ficien	ıt prob	lem state	space for a pro	blem		
<b>CO2:</b> Discuss states and test	how search strategies	s will s	find s	solutio	ns to probl	ems by system	atically generati	ng new	
CO3: Apply I	Hill-climbing, simulat	ed and ems	nealin	ıg, Loo	cal Beam S	earch, Genetic	Algorithms (Lo	cal search	
CO4: Describ	es how to solve unpre	edictal	bility.	conti	ngencies of	f agent's proble	em-solving proc	ess. in	
which the age	nts' GAME goals are	in cor	nflict		0	0	61	<b>,</b>	
CO5: Underst	and the features and	worki	ng of	Exper	t System.				
			U	NIT-	I				
Introduction: W	hat Is AI?. The Foun	datio	ns of A	Artific	- ial Intellig	ence			
Intelligent Agen	nts: Agents and Enviro	onmer	nts, G	ood B	ehaviour:	The Concept of	Rationality, The	e Nature of	
Environments, A	And the Structure of A	Agents	5.			-	-		
Solving Problem	ns by Searching: Pro	blem-	Solvi	ng Ag	ents, Exan	ple Problems,	Searching for So	olutions	
			UI	NIT-1	II				
Uninformed Sec	arch Strategies: BFS	, DFS	, Dep	th –lin	nited searc	h, IDA, Bidire	ctional search		
search, Learning	ristic) Search Strateg g to search better. Heu	gies- ( iristic	Func	y best- tions.	-first searc	h, A <sup>*</sup> search, I	Memory-bounde	d heuristic	
			UN	IT-I	II				
<i>Beyond Classic</i> Continuous Spa	al Search: Local S ces, Searching With I	Search Partial	Alg Obse	orithm ervatio	ns and Op ons. Search	otimization Proing with Nondo	oblems, Local eterministic Acti	Search In	
			UN	I –TIN	V				
Adversarial Sea Constraint Sati Inference In Csp	erch: Games, Optimal sfaction Problems: D os, Backtracking Sear	l Deci Defini ch Foi	sions ing C r Csps	In Gar onstra s, Loca	mes, Alpha int Satisfa al Search F	a—Beta Prunin ction Problem For Csps, The S	lg s, Constraint Pr Structure Of Prob	opagation: olems	
			U	NIT-	V				
<i>Introduction to Expert System:</i> What are Expert Systems, Features of Expert system, Features of good expert system, Role of human in Expert system, Expert system organization, Difference between expert system and conventional program, Basic activities of expert system and the areas in which they solve problems, Prospector system features, working.									

### **Text Books:**

- 1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, 2010. Pearson Education.
- 2. Donald A.Water man," A Guide to expert systems", Addison Wesley publishing company.

### **Reference Books:**

1. Elaine Richie Kevin Knight [2008], [3rd Edition], Artificial Intelligence, TMH

#### Web References:

- 1. https://onlinecourses.nptel.ac.in/noc18\_cs51
- 2. https://www.geeksforgeeks.org/artificial-intelligence-an-introduction/
- 3. https://www.tutorialspoint.com/artificial\_intelligence/artificial\_intelligence\_expert\_systems.htm

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e there will be two questions from each unit and the student should answer any one question.

# **INTRODUCTION TO INFORMATION SYSTEMS (IIS)**

	Scheme: 2017						
Course Code         Category         Hours/Week         Credits         Maximum Marks							
OE302Open Elective - 1LTPCContinuous Internal AssessmentEnd ExamTO'	ГAL						
	00						
Sessional Exam Duration:2 Hrs End Exam Duration:3	B Hrs						
Course Outcomers. At the and of the course students will be able to							
Course Outcomes: At the end of the course students will be able to							
<b>CO2</b> : Understand the page replacement and CPU Scheduling Algorithms							
<b>CO3:</b> Understand the phases of software development life cycle and process models							
CO4: Design ER model for real life scenarios							
<b>CO5:</b> Apply SQL commands to create, update, modify and retrieve data from the data bases.							
<b>CO6:</b> Apply normalization techniques to normalize the database							
UNIT-I							
<b>Fundamentals of Computers &amp; Computer Architecture:</b> Introduction Organization of a small computer Central Processing Unit Execution cycle Instruction	1						
categories, measure of CPU performance, Memory, Input/output devices, BUS, addressing modes	L						
System Software:							
Assemblers, Loaders and linkers, Compilers and interpreters.							
UNIT-II							
<i>Operating System:</i> Introduction, Memory management schemes, Page replacement algorithms, Process management, (	CPU						
scheduling algorithms.							
Software engineering:							
Software engineering: Introduction to Software engineering, Life cycle of a software project, software	are						
Development models.							
UNIT– III							
Relational Database Management System:							
Introduction to DBMS, the database technology, data models, Database Users.							
Entity Relationship (E-R) Modelling:							
millouduction, Notations, Modelling E-K Diagrams, Case Studies, Ments and Dements of E-K							
INIT_IV							
Structured Ouery Language (SOL):							
Introduction to SQL, Data types, Data Definition language commands, Data Manipulation Language	nguage						
Commands and Data control Language Commands, Candidate Key, Primary key, Foreign key, Select Clause,							
Where Clause, Logical Connectives – AND, OR, Range Search, Pattern Matching, Order By, Group By, Set							
Operations – Union, Intersect and Minus, Aggregate Functions, Join Operations.							
UNIT– V							
Normalization							

Introduction, Need for Normalization, Process of Normalization, Types of Normal Forms (1 NF, 2 NF, 3 NF & BCNF), Merits and Demerits of Normalization.

### **Text Books:**

- 1. Campus Connect Foundation Program Computer Hardware and System Software Concepts, Programming Fundamentals- Vol. 1, INFOSYS.
- 2.Campus Connect Foundation Program Relational Database Management System, Client Server Concepts, Introduction to Web Technologies Vol. 4, INFOSYS

3. Henry F. Korth & Abraham Silberschatz, - Data Base System Concepts, 5<sup>th</sup> Edition, 2005, Mc Graw ill

# **Reference Books:**

- 1. M. Morris Mano [2011], [3 rd Edition], Computer system architecture, Pearson Education, 2011
- 2. Sommerville [2008], [7th Edition], Software Engineering, Pearson education.
- 3. Raghu Ramakrishna and Johannes Gehrke [2003], [3rd Edition], Data Base Management Systems, TATA Mc GrawHil
- 4. Tanenbaum [2000], Modern Operating System, Pearson Education.

### Web References:

- 1. https://www.w3schools.com/sql/
- 2. https://www.geeksforgeeks.org/dbms/
- 3. https://www.tutorialride.com/software-engineering/software-engineering-tutorial.htm

## **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No.1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER / OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e. there will be two questions from each unit and the student should answer any one question.

### WEB DEVELOPMENT PROGRAMMING (WDP)

V Semester: B.Tech					Schen	ne: 2017			
<b>Course Code</b>	Category	Hours/Week		Credits	Maximum Marks				
OE303	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	0	0	3	40	60	100	
Sessional Ex	am Duration: 2 H	rs				End Exam Duration: 3 Hrs			
<b>Course Outco</b>	omes: At the end o	of the	course	e stude	ents will be	able to			
CO1: Unders	tand the fundament	tal cor	ncepts	of wel	o designing.				
CO2: Design	a static web page i	using ]	HTML	tags a	and attribute	es.			
CO3: Develo	p web pages using	HTM	L and	Casca	ding Styles	sheets.			
CO4: Unders	stand the concepts of	of serv	ver side	e prog	ramming.				
CO5: Create	dynamic and intera	ctive	websit	tes usi	ng database	connection.			
	UNIT-I								
<b>Web Technology Fundamentals:</b> Introduction to the Web, Web servers and Clients, Resources, URL and its Anatomy, Message Format, Persistent and Non-persistent connections, Web Caching, Proxy, Java and the Net, Java Network Classes and Interfaces, Looking up Internet Address.									

### UNIT-II

**HTML**: HTML and its Flavors, HTML basics, Elements, Attributes and Tags, Basic Tags, Advanced Tags, Frames, Images, Meta tag, Planning of Web page, Model and Structure for a Website, Designing Web pages, Multimedia content.

### UNIT-III

**Cascading style sheets**: Advantages, Adding CSS, Browser compatibility, CSS and page layout, Selectors.

### UNIT-IV

**Server side programming:** Server-side Java, Advantages over Applets, Servlet alternatives, Servlet strengths, Servlet architecture, Servlet life cycle, Generic and HTTP Servelet, First servlet, Passing parameters to servlets, Retrieving parameters, Server-side include, Cookies, Filters, Problems with servlet, Security issues, JSP and HTTP, JSP Engines, How JSP works, JSP and Servlet, Anatomy of a JSP page, JSP syntax, JSP components.

### UNIT-V

**Database Connectivity:** Database connectivity, JDBC drivers, Basic steps, Loading a driver, Making a connection, Execute and SQL statement, SQL statements, Retrieving the result, Getting database information.

#### **Text Books :**

- 1. UtamK.Roy, "Web Technologies", Oxford Higher Education, 1<sup>st</sup> Edition, Seventh Impression.
- 2. K.L.James, "The Internet- A User Guide ", 2nd Edition, PHI Publications.

### **Reference Books :**

- 1. Introduction to Java Programming<sup>I</sup>, Y.Daniel Liang, 6<sup>th</sup> Edition, Pearson Education, 2007
- 2. Web Technologies Srinivasan, Pearson Education, 2012.
- 3. Kognet Learning Solutions inc.,"HTML5 in Simple Steps", DreamTech press.
- 4. Java EE 5 for Beginners, Ivan Bayross, Sharanam Shah, Cynthia Bayrossand. Vaishali shai, SPD.

### Web References:

- 1. https://www.tutorialspoint.com/html/
- 2. https://www.tutorialspoint.com/css/
- 3. https://www.javatpoint.com/java-tutorial

### **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

### **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions i.e there will be two questions from each unit and the student should answer any one question.
# **INTRODUCTION TO CYBER SECURITY(ICS)**

V Semester: I	B.Tech						Sche	me: 2017
<b>Course Code</b>	Category	Ηοι	ırs/We	eek	Credits	Ma	ximum Marks	
OE304	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Ex	xam Duration:2 H	Irs				End E	xam Duration	:3 Hrs
Course Outo	comes: At the end	of th	ne cour	rse stu	dents will	be able to		
CO1: Cyber	Security architect	ure p	rinciple	es				
CO2: Identi	fying different clas	sses c	of attac	ks				
CO3: Under	stand about cyberd	crime	with r	nobile	and wireles	ss devices		
CO4: Under	stand about the too	ols an	nd meth	10ds u	sed in cyber	crime.		
CO5: Under	stand about cyber	secui	rity and	l socia	l media ma	rketing.		
				UN	IT–I			
Who are Cybercrimes: A Cybercrimes, C	Sybercrime: Definition percriminals? Class An Indian Perspec Cybercrime Era: Su	ssificative,	and Of ations Cyber al Man	of C crime tra for	ybercrimes, and the Ind the Netizen	d, Cybercrime , Cybercrime: dian ITA 2000, ns.	The Legal Po A Global Per	spective or
				UNI	T–II			
<i>Cyber offenses</i> How Criminals stalking, Cybe Computing.	s Plan Them –Intr er cafe and Cybe	oduct rcrim	tion, H nes, Bo	ow Crotnets:	riminals Pla The Fuel	n the Attacks, for Cybercrin	Social Enginee ne, Attack Ve	ring, Cybe ctor Cloud
				UNI	T– III			
Cybercrime M	obile and Wireless	Dev	ices					
Introduction, Pr Mobile and Wir Mobile Devices Security Implic Security Policie	oliferation of Mol eless Computing E , Authentication Se cations for Organiz es and Measures ir	bile a bra, Service cation Mol	nd Wi ecurity e Secur s, Orga oile Co	reless Chall rity, A anizati omputi	Devices, T enges Posec ttacks on M onal Measu ng Era, Lap	rends in Mobil d by Mobile Dev obile/Cell Phon res for Handlin tops.	ity, Credit Caro vices, Registry nes. Mobile Dev g Mobile, Orga	d Frauds in Settings fo vices: nizational
				UNI	T– IV			

# Tools and Methods Used in Cybercrime

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Phishing.

#### UNIT-V

#### Cyber Security:

Organizational Implications Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

- 1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole, SunitBelapure, Wiley.
- 2. Principles of Information Security, MichealE.Whitman and Herbert J.Mattord, Cengage Learning.

# **Reference Books:**

- 1. Information Security, Mark Rhodes, Ousley, MGH.
- 2. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press

#### Web References:

 $1.https://www.tutorialspoint.com/fundamentals_of\_science\_and\_technology/cyber\_crime\_and\_cyber\_security.htm$ 

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# **INTERNET OF THINGS (IOT)**

V Semester: B.Tech								Sche	eme: 2017	
Course	Course	Hou	rs/Wee	k	Credits		Maxin	num Marks		
Code	Category									
OE305	Open Elective - 1	L	Т	Р	С	Continuo Interna Assessme	ous l ent	End Exam	TOTAL	
		3	0	0	3	40		60	100	
Sessional E	xam Duration: 2 I	Irs	1			L	End I	Exam Duratio	on: 3 Hrs	
<b>Course Out</b>	tcomes: At the end	of th	e cours	e the	student w	ill be able to				
CO1: Under	stand the basic kno	wledg	ge of Int	ernet	of things a	nd its design				
CO2: Unders	tand the purpose of	fsenso	ors and	Actua	tors in IoT	`				
CO3: Analy	ze Various IoT Pro	tocols	8							
CO4: Design	n IoT Projects Usin	g Ard	luino							
CO5: Under	stand Raspberry-Pi	Proc	essor an	d Ras	pbian Ope	rating Systen	ns			
				UN	I - I					
Introduction	n to IoT:									
Definition as	nd Characteristics of	of IoT	, Physic	al De	sign and L	ogical Desig	n, IoT	Enabling Tecl	nnologies,	
IoT Levels a	and Deployment Te	mplat	es, IoT	Vs M	2M					
				UN	IT_II					
UNII – II Sensing and Actuation:										
Definition of Sensor Sensor features Resolution Classes Different types of sensors Actuator Different										
types of Actuators, purpose of Sensors and Actuators in IoT										
types of Actuators, purpose of Sensors and Actuators in 101										
UNIT – III										
Wireless Technologies and Data Transmission for IoT:										
Wi-Max, Wi-Fi (802.11), Bluetooth/Bluetooth smart, Zigbee/Zigbee smart, Cellular, NFC, Serial										
Transmissio	n, RS-232, RS-485	, I2C	Inter-In	tegrat	ed Circuit	, Ethernet, CA	AN bus	s, USB, Firewa	all, Serial	
ATA, Parall	el Transmission.			-						
Dullding L	T	. A			<u> </u>	a of Andria			) arreit ala	
potentiometer	er, Sensors, LCD, H	: Ara Blueto	oth, Wi	ЭЕ, Р -Fi, С	PS, RFID	with Arduin	no, Ini D	terracing LEI	J, switch,	
				UN	IT –V					
<b>Raspberry</b>	Pi:									
Linux basics	s, Linux File system	ı, Nav	igating	the Fi	le system,	Text Editors,	Acces	sing Files, Pe	rmissions,	
Processes, L	inux Graphic user	Interf	face, Ra	spber	ry Pi Proc	essor, Raspbe	erry Pi	Vs Arduino,	Operating	
system bene	fits, Raspberry Pi S	Set up.	, Config	uratio	on.	, I	2	,	1 0	
		1								
Text Books	:									
1. Arsh	eepBahga , Vijay N	Aadis	etti ,Inte	ernet o	of Things:	A Hands-On	Appro	ach Paperback	k, 2015	
2. Rajk	umar Bhuyya, Inter	rnet o	f Things	s: Prir	ciples and	, Paradigms	2016			
3. Adeel Javed, Building Arduino Projects for the Internet of Things, Apress, 2016										
4. Wolfram Donat, Learn Raspberry-Pi with Python, Apress, 2016										
<b>Reference F</b>	Books:									
1. Char	les Bell, Beginning	g Sens	or Netw	orks/			T			
	ý t				with Ardu	ino and Raspl	berry-i	Pi, Apress,201	6	
2. Andr	rianMcEwen , Haki	im Ca	simally,	Desi	with Ardu gning of Iı	ino and Raspl	ngs, Jo	hn Wiley,201	6 4	
2. Andi 3. Warr	rianMcEwen, Haki	im Ca	simally, aspherry	, Desi	with Ardu gning of Iı Apress 201	ino and Raspl nternet of Thi 6	ngs, Jo	Pi, Apress,201 hn Wiley,201	6 4	
2. Andi 3. Wari	rianMcEwen , Haki ren Gay, Mastering ences:	im Ca the Ra	simally, aspberry	, Desi /-Pi, /	with Ardu gning of Iı Apress,201	ino and Raspl nternet of Thi 6	ngs, Jo	h, Apress,201 hn Wiley,201	6 4	
2. Andi 3. Warr Web Refere	rianMcEwen , Haki ren Gay, Mastering ences: s://nptel.ac.in/cours	the Ra	simally, aspberry	, Desi 7-Pi, <i>1</i>	with Ardu gning of Iı Apress,201	ino and Raspl nternet of Thi 6	ngs, Jo	h, Apress,201 hn Wiley,201	<u>6</u> 4	

- 3. https://nptel.ac.in/courses/108108098/4
- 4. https://onlinecourses.nptel.ac.in/noc19\_ee28

# **Question Paper Pattern:**

# Sessional Exam:

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains hree short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# NANO TECHNOLOGY (NNT)

V Semester: B	.Tech				Scheme: 2017					
<b>Course Code</b>	Course	Hours	/Week		Credits	Maxi	mum Marks			
	Category									
OE306	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	xam Duration: 2 H	rs			End Exam Duration: 3 Hrs					
Course Outcomes: At the end of the course the student will be able to										
CO1: Acquire	e some of the fundar	nental p	rinciple	es beh	ind nanoted	chnology and nand	omaterials and	their vital		
role in 1	novel sensing prope	rties and	l applic	ations	5.					
CO2: Unders	tand the fabrication.	, charact	terizatio	on, an	d manipula	tion of nano mat	erials, Nano se	ensors and		
introdu	ction to sensors.				-					
CO3: Unders	tand about metal nat	nopartic	le based	d sens	sors and nat	nowire based sens	sors.			
CO4: Understand about sensors based on nanostructures of metal oxides.										
			τ	UNIT	– I					
Introduction to	Introduction to Nanotechnology:									

Definition of nanotechnology; main features of nanomaterials; types of nanostructures (0D, 1D, and 2D structures); nanocomposites; and main chemical/physical/electrical/optical properties of nanomaterials. Methods for characterizing the nanomaterials: Atomic Force Microscopy (AFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and spectroscopy- and spectrometry-based surface analysis techniques. Fabrication of sensors by bottom-up and top-down approaches; self-assembly of nanostructures; and examples for nanotechnology application

#### UNIT – II

# Introduction to Sensors' Science and Technology:

Definition of sensors; main elements of sensors; similarities between living organisms and artificial sensors; working mechanism of physical sensation (seeing, hearing, and feeling) and chemical sensation (smelling and tasting); the parameters used for characterizing the performance of sensors: accuracy, precision, sensitivity, detection limit, dynamic range, selectivity, linearity, resolution, response time, hysteresis, and life cycle

# UNIT – III

# Metal nanoparticle-based Sensors:

Definition of nanoparticle; features of nanoparticles; and production of nanoparticles by physical approach (laser ablation) and chemical approaches (Brust method, seed-mediated growth, etc.). Quantum Dot Sensors. Definition of quantum dot; fabrication techniques of quantum dots; Macroscopic and microscopic photoluminescence measurements; applications of quantum dots as multimodal contrast agents in bioimaging; and application of quantum dots as biosensors.

UNIT – IV

# Nanowire-based Sensors:

Definition of nanowires; features of nanowires; fabrication of individual nanowire by top-down approaches and bottom-up approaches; and fabrication of nanowire arrays (fluidic channel, blown bubble film, contact printing, spray coating, etc.).Carbon Nanotubes-based Sensors: Definition of carbon nanotube; features of carbon nanotubes; synthesis of carbon nanotubes; fabrication and working principles of sensors based on individual carbon nanotube; fabrication and working principles of sensors based on nanotubes.

# UNIT – V

# Sensors Based on Nanostructures of Metal Oxide:

Synthesis of metal oxide structures by dry and wet methods; types of metal oxide gas sensors (0D, 1D, and 2D); defect chemistry of the metal oxide sensors; sensing mechanism of metal-oxide gas sensors; and porous metal-oxide structures for improved sensing applications.

1. Jiří Janata, Principles of Chemical Sensors, Springer, 2d Edition (1989). 2. Roger George Jackson, Novel Sensors and Sensing, CRC Press (2004).

#### **Reference Books :**

- 1. Florinel-Gabriel Banica, Chemical Sensors and Biosensors: Fundamentals and Applications, John Wiley and Sons (2012).
- 2. Ramsden Jeremy, Nanotechnology, an Introduction. Elsevier (2011).

#### **Question Paper Pattern:**

# Sessional Exam:

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

# End Exam:

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# **REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEMS (RSGIS)**

V Semester : B.	Tech			Scheme : 2017					
<b>Course Code</b>	Category	Ηοι	ırs / W	/eek	Credits	Maximum Marks			
OE307	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	Total	
		2	1	-	3	40	60	100	
Sessional Exam	End Exam Duration : 3 Hrs								

**Course Outcomes:** At the end of the course students will be able to

**CO1:** Understand the concept of electromagnetic radiation and its interaction with earth's surface

- CO2: Understand air borne and space borne platforms, space imaging satellites of different Countries.
- **CO3:** Understand the image processing techniques and applications of remote sensing.
- **CO4:** Understand the concept of GIS and organization of GIS data structures.

**CO5:** Understand primary and secondary methods of capturing spatial and attribute data.

# UNIT - I

*Introduction to Remote Sensing:* Concept and Scope of Remote Sensing: Definition – Physics of Remote Sensing – Electro Magnetic Radiation (EMR), Process and Characteristics of Remote Sensing System – Energy Interaction with the atmosphere and Earth Surface Features – Vegetation, soils, water– Spectral Reflectance Curves, atmospheric windows, Advantages and limitations of remote sensing.

# UNIT - II

*Platforms and Sensors:* Remote Sensing Systems: Platforms: Introduction – Types – Satellites and orbits, Passive and Active sensors – Spatial, spectral, radiometric and temporal resolution of satellites, Whiskbroom and Push-broom scanners, Multi-band concepts and False Color Composites - Some remote sensing satellites and their features.

# UNIT - III

*Image Processing Techniques and Remote Sensing Applications:* Digital Image Processing: Image enhancement – Contrast stretch, Spatial filtering and edge enhancement; Classification – Supervised and unsupervised classification – Visual image interpretation techniques.

Remote Sensing Applications - Applications in land use and land cover analysis - Mapping of forest and agriculture - Watershed management - Drought Assessment - Environmental modeling and other applications.

# UNIT - IV

*Geographic Information System: Basic Concepts:* Definition - Components - Functions of GIS - Areas of GIS application - Advantages and Limitations of GIS - Information Organization and Data Structures - Raster and Vector data structures - Data file organization and formats - Data Base Management Systems.

# UNIT - V

*GIS Data Input & Editing:* Method of Spatial and Attribute data capture – Primary and Secondary digitization and scanning method - Techniques and procedure for digitizing, Topology – Errors of Digitization and rectification - Re-projection - Transformation and Generalization - Edge matching and Rubber sheeting - Proximity - Buffering and overlay.

- 1. M. Anji Reddy, Text Book of Remote Sensing and Geographic Information System, BS Publication.
- 2. Lo C.P. & Yeung A.K.W., (2004), Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi.
- 3. Thomas Lillesand, Ralph W Kiefer and Jonathan Chipman "Remote Sensing and Image Interpretation", John Wiley & Sons, India

#### **Reference Books :**

- 1. B.Bhatta, Remote sensing and Geographic Information System, Oxford Publications.
- 2. Siddiqui, M.A.(2006), Introduction to Geographical Information System, Sharda Pustak Bhavan, Allahabad.
- 3. Curran, Paul J (1985), Principles of Remote Sensing, Longman, London.
- 4. Floyd F Sabins Jr., Remote Sensing Principles and Interpretation, Freeman and Co., San Franscisco.

# Web References:

1. www.nptel.ac.in/courses

# **Question Paper Pattern:**

#### Sessional Exam:

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# **OPTIMIZATION TECHNIQUES (OT)**

VI Sem	ester:	B.Tec	'ech					Sch	eme: 2017
Course	Code	Category	H	lours	/	Credits	Maxim	ım Marks	
OE3	08	Open Elective - 1	L	T	Р	С	Continuous Internal Assessment	End Exam	TOTAL
			3	-	-	3	40	60	100
Session	al Exar	m Duration: 2 Hrs					End F	Exam Durat	tion: 3 Hrs
~									
Course	Outco	mes: At the end of t	the co	ourse s	stude	ents will be	e able to		
<b>CO 1:</b>	Under	rstand basics of oper	ratior	is rese	earch	n, linear pr	ogramming models		
CO 2: Solve transportation related problems									
CO 3: Solve assignment problems and sequencing problems									
CO 4: Solve queuing and game theory related problems									
CO 5: Solve project management problems									
UNIT – I									
Introdu	ction:	Definition, Signifi	icanc	e of	Ope	erations R	esearch, Models in	Operations	Research,
Applica	tion Ar	eas of Operations R	esear	ch	Crea	mbiasl sal	tion of LDD Slock	Cumlus on	d Antificial
variable	s. Simr	olex method. Big M	meth	od. D	eger	prical soft neracy in L	P.P. Duality Concept	surplus and	i Afunciai
	-, <u>r</u>				UN	NIT – II		-	
Transp	ortatio	n Problems: Introd	uction	n Bala	ince	d and unba	lanced Transportation	problems, I	nitial basic
feasible	solutio	n using N-W corne	r rule	, leas	t cos	t method a	and Vogel's approxim	ation metho	d, Optimal
Solution	(MOE	OI method), Degener	racy i	n Tra	nspo	ortation Pro	oblem		
					UN	IT – III			
Assignm	nent P	roblems: Introduct	tion,	The	Assi	gnment A	lgorithm (Hungarian	Assignmen	t method),
Balance	d and	Unbalanced Assign	nmen	t Pro	blem	ns, Travell	ling Salesman Proble	em as an A	Assignment
Sequen	ing N	Iodels: Introductio	on, G	lenera	1 as	sumptions	, processing n jobs	through 2	machines.
processing 'n' jobs through m machines, Processing 2 jobs through m machines									
					UN	IT – IV			
Game T	heory	Definitions and Te	ermin	ology	, Tw	o Person Z	Zero Sum Games, Pure	e Strategy G	ames (with
Saddle F Graphic	Point), I al meth	Principle of Domina od	nce, S	Soluti	on fo	or Mixed S	trategy Games (Game	s without Sa	ddle Point)
Queuin	g Theo	ry: Introduction, sin	ngle c	hanne	el - p	oisson arri	vals - exponential ser	vice times w	vith infinite
populati	on, and	l Multi-channel - po	oisson	arriv	als -	Exponent	ial service times with	infinite pop	ulation.
					U	$\mathbf{VII} - \mathbf{V}$			

**Project Management:** Phases of project management, guidelines for network construction, critical path, forward and backward pass, floats and their significance, crashing for optimum duration.

1. Hamdy, A. Taha, Operations Research-An Introduction, Prentice Hall of India Pvt. Ltd

2. S.D. Sharma, Operations Research, Kedarnath, Ramnath & Co., Meerut,

3. R. Paneer Selvam, Operations Research , PHI Learning Pvt. Ltd., New Delhi

# **Reference Books:**

- 1. Hillier / Lieberman, Introduction to Operations Research , Tata McGraw Hill Edition
- 2. J.K. Sharma, Operations Research-Problems and Solutions, Macmillan India Ltd
- **3.** Billy E Gillett, Introduction to Operations Research A Computer Oriented Algorithmic Approach, Tata McGraw Hill Edition
- 4. V.K. Kapoor, Operation research

#### **Question Paper Pattern:**

#### **Sessional Exam**

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

# **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e. there will be two questions from each unit and the student should answer any one question

# **RENEWABLE ENERGY SYSTEMS (RES)**

V Semester: B.Tech Scheme: 2017												
Course	Category	Hor	ırs/W	eek	Credits	May	rimum Mai	rks				
Code	Category	1100			Cicuits	11142						
OE309	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL				
		3	0	0	3	40	60	100				
Sessional l	Exam Duration: 2 l	Irs				End Ex	am Duratio	on: 3 Hrs				
Course Ou	Course Outcomes: At the end of the course the student will be able to											
<b>CO1:</b> Und	erstand the basics te	rms, defi	nition	s relat	ed to solar en	ergy conversion	n, solar radi	ation				
meas	suring instruments.	as of Sol	or Col	lastar	and their on	nlications						
CO2: Und	erstand different typ	es of Sol	ar Col	of Wi	s and their ap	plications.	actoristics					
CO3. Ulu	lerstand the methods	to harne	ss Fle	or wi	l Energy from	Geothermal a	nd Ocean er	nergies				
<b>CO5:</b> Und	erstand the principle	s of bio o	conver	sion	types, combu	stion characteri	stics and its					
appli	ications	5 01 010 1		51011,	cypes, comou		sties and its					
CO6: Und	erstand Direct Energ	y Conve	rsion	princi	ple from Fuel	cells and MHE	) generators					
		-										
UNIT - I												
Principles	of The role and	The role and potential of new and renewable source, the solar energy option,										
Solar	Environmenta	Environmental impact of solar power, physics of the sun, the solar constant,										
Radiation	extraterrestria	l and t	errestr	ial so	olar radiation	n, solar radiat	ion on tit	led surface,				
	instruments fo	or measu	ring so	olar ra	diation and su	unshine, solar ra	adiation dat	a.				
Solar Fra	rav Flat plate ar	d conce	ntratin		I - II llectors class	sification of a	oncontrating	acollectors				
Collection	orientation an	d therma	l analy	vsis a	dvanced colle	ectors	Jucentiating	; conectors,				
Solar Ener	rgv Different me	thods. So	ensible	e. late	ent heat and	stratified stora	ige, solar r	onds. Solar				
Storage A	nd Applications-	Solar	heatir	ig/coo	oling techniq	ues. Solar di	istillation a	and drying,				
Applicatio	ns photovoltaic	energy co	nvers	ion.		-						
				UNI	Γ – III							
Wind Ene	rgy Sources and p characteristic	otentials s, Betz cr	, horiz iteria.	zontal	and vertical a	axis windmills,	performanc	e				
Biomass	Principles of	Bio-Conv	version	n, Ana	erobic/aerobi	ic digestion, typ	bes of Bio-g	as digesters,				
	gas yield, con	nbustion	charac	cteristi	ics of bio-gas	, utilization for	cooking, I.	C. Engine				
	operation and	econom	ic aspe	ects.								
0 4		C	11	UNI	$\frac{\Gamma - IV}{C1}$	(1	· · · · · ·	1.				
Geotherm	al Resources, ty	pes of we	ells, m	etnoa	s of narnessin	ig the energy, p	otential in I	ndia.				
Ocean	OTEC Princi	nlac utili	zation	satti	ng of OTEC r	lants thermod	unamic ovo	las Tidal				
Energy	and wave ene	rav <sup>.</sup> Pote	ntial a	, settin	nversion tech	niques mini-hy	vdel nower i	nlants and				
Energy	their economi	cs.	iitiai a		inversion teen	inques, inni ng	y dei power	prants and				
				UNI	T - V							
Direct End	ergy MHD generat	ors, prin	ciples,	disso	ciation and ic	nization, Hall e	effect, magn	etic flux,				
Conversio	n MHD acceler	MHD accelerator, MHD Engine, power generation systems. Fuel cells, principle.										
	Faradays laws, thermodynamic aspects, selection of fuels and operating conditions.											
Text Book	s:											
1.G.D. Rai	, "Non-Convention	al Energy	Sour	ces". 2	2011							
2.Ramesh	& Kumar, "Renewal	ole Energ	y Tec	hnolo	gies", Narosa	. 1997						
Reference	Books :											
1.Tiwari an	nd Ghosal, "Renewa	ble ener	gy res	ources	s", Narosa.20	05						
2.Ashok V	Desai, "Non-Conve	ntional E	energy	", Wi	ley Eastern.19	990						
3.K Mittal	,"Non-Conventional	Energy	Syster	ns". V	Vheeler. 1997	1						

4.Sukhatme, "Solar Energy". TMH, 2008

# Web Resources:

1.https://en.wikipedia.org/wiki/Solar\_irradiance

2.http://sfera.sollab.eu/downloads/Schools/Eduardo\_Zarza\_Basic\_concepts.pdf

3.https://en.wikipedia.org/wiki/Solar\_energy

4.https://en.wikipedia.org/wiki/Solar\_energy

5. https://solarprofessional.com/articles/design-installation/solar-energy-storage

6.https://www.energy.gov/science-innovation/energy-sources/renewable-energy/wind

7.https://www.eia.gov/energyexplained/?page=biomass\_home

8.https://en.wikipedia.org/wiki/Geothermal\_energy

9.https://www.renewableenergyworld.com/ocean-energy/tech.html

10.http://www.mhdenergy.com/

**Question Paper Pattern:** 

# Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

# **INTRODUCTION TO JAVA**

V Semester: B.Tech					Scheme: 2017					
CourseCode	Category	Hou	rs/We	ek	Credits	Ma	<b>Maximum Marks</b>			
OE310	Open Elective - 1	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		2	1	-	3	40	60	100		
Sessional Ex	am Duration:2 I	Hrs				End E	xam Duration:	3 Hrs		
<b>Course Outc</b>	omes: At the end	of the	e cours	e stude	ents will be	able to				
CO1: Unders	stand fundamenta	ls of c	ops co	oncepts	s, input and	output				
CO2: Unders	stand the classes a	and ob	jects.							
CO3: Understand the Inheritance and interfaces										
CO4: Unders	stand the string ha	ndlin	g meth	ods						
CO5: Under	stand the exception	on han	dling							
UNIT–I										
statements, Read	ling console input	, writi	ng con		utput, arrays	s.	nables, Operation			
<b>Introducing Cl</b> keyword, finaliz	<b>asses:</b> Class fun e	dame	ntals, o	declari	ng objects,	introducing m	ethods, Constru	uctors, this		
				UNI	T_III					
<b>Inheritance:</b> Inl Interfaces: Defin	neritance basics, u ing interface, imp	sing s lemer	uper, n nting ir	nethod	overriding,	abstract class, u	ising final with i	nheritance,		
				UNI	[ <b>T</b> – <b>IV</b>					
String Handlin searching strings	<b>g:</b> String constructs, modifying string	ctors, gs. Str	Specia ingBuf	l strin	g operations ss and its m	s, character extracter extracted ethods.	raction, string c	omparison,		
				UNI	T– V					
<b>Exception Han</b> exceptions, creat	<b>dling:</b> Fundamer ing your own exc	ntals, eptior	except subcla	ion tyj asses.	pes, try, ca	tch, throw, thr	ows, finally. Ja	wa built-in		

- 1. Herbert Schildt [2008], [9th Edition], The Complete Reference Java2, TATA McGraw-Hill.
- 2. E Balaguruswamy [2007], [3 rd Edition], Programming with Java, A Primer, TATA McGraw-Hil.

#### **ReferencebBooks :**

- 3. Bruce Eckel [2008], [2nd Edition], Thinking in Java, Pearson Education.
- 4. H.M Dietel and P.J Dietel [2008], [6th Edition], Java How to Program, Pearson Ed.

# Web References:

5. https://www.tutorialspoint.com/java/index.html

# **Question Paper Pattern:**

# Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second Sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions.i.e. there will be two questions from each unit and the student should answer any one question.

# **OBJECT ORIENTED PROGRAMMING THROUGH JAVA (OOP)**

VI Semester: B	.Tech				Scheme: 2				
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
OE311	Open Elective -2	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
		3	0	0	3	40	60	100	
Sessional Exa	am Duration:2 Hr	'S				End E	xam Duration	:3 Hrs	
Course Outco	mes: At the end of	f the c	course	studen	ts will be a	ble to			
CO1: Underst	and the basic prog	ramm	ing co	nstruc	ts and objec	et oriented parac	ligms.		
CO2: Compre	ehend the java con	cepts	packag	ges and	d interfaces				
CO3: Implem	ent programs on s	tring 1	handlii	ng met	thods.				
CO4: Underst	tand the fundament	tals of	fexcep	otion h	andling me	chanism.			
CO5: Implem	nent programs on n	nultitl	nreadir	ng con	cepts.				
	1 0			U	•				
				UNI	Г– І				
Fundamentals o	of Object –Orien	ted I	Progra	mmin	g: Introdu	ction, Object-C	riented Paradig	gm, Basic	
Concepts of Obje	ct Oriented program	mmin	g, Ben	efits o	f OOP, and	Applications of	f OOP.		
Introduction to J	lava: Overview of	java,	Java E	Buzzw	ords, Data t	ypes, Variables	Operators.		
Decision Making	g-Branching & L	oopir	ng: sin	nple if	f statement,	if-else stateme	ent, nested if-el	lse, else if	
ladder, switch sta	tement, While, do-	while	, for st	ateme	nts, Arrays,	Classes, object	s and methods.		
				UNIT	<u>- II</u>				
I/O: I/O Basics, F	Reading Console in	iput, v	vriting	Conse	ole output.				
Inheritance: Bas final keyword.	ic concepts, metho	d ove	rriding	g, supe	r keyword,	dynamic metho	d dispatch, Abs	tract class,	
Packages and In	terfaces: Packages	s, Acc	ess pro	otectio	on, Importin	g packages, Inte	erfaces.		
				UNIT	– III				
String Handling	: String Construct	tors, S	Special	l Strin	g Operation	ns-String Litera	ls, String Cond	catenation,	

Character Extraction, String Comparisons. Searching Strings, Modifying a string.

# UNIT-IV

Exception Handling: Fundamentals, Types of Exceptions, Usage of try, catch, throw throws and finally keywords.

# UNIT-V

Multithreading: Concepts of multithreading, Creating threads by extending Thread class and implementing Runnable interface, isAlive() and join () methods, Thread Priorities, Synchronization, Inter thread communication.

1. Herbert Schildt [2017], [10th Edition], Java -The Complete Reference, TATA McGraw-Hill. Reference Books :

1. Bruce Eckel [2014], [2<sup>nd</sup> Edition], *Thinking in Java*, Pearson Education.

2. E.Balagurusamy, Programming with Java: A primer, 5th Edition, Tata McGraw-Hill, 2017.

3.H.M Dietel and P.J Dietel [2017], [11th Edition], Java How to Program, Pearson Ed.

#### Web References:

1. https://nptel.ac.in/courses

2. https://www.tutorialspoint.com/java/

3. https://www.javatpoint.com

**Question Paper Pattern:** 

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e there will be two questions from each unit and the student should answer any one question.

# ETHICAL HACKING (EH)

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Г

VI Semester:	B.Tech				Scheme: 2017					
<b>Course Code</b>	Category	Hou	rs/We	eek	Credits	Ma	ximum Marks			
OE312	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2 Hrs	5				End	Exam Duratio	on:3 Hrs		
Course Outco	omes: At the end of	the co	ourse s	tudent	ts will be	able to				
CO1: Unders	stand the importance	of see	curity	and et	hical hack	king.				
CO2: Unders	stand about foot prin	ting a	nd typ	es of a	attacks in	social engineer	ring.			
CO3: Unders	stand about sniffers a	and D	oS atta	icks.						
CO4: Unders	stand the importance	of Se	ssion	Hijack	king types	and SQL Inject	ction.			
CO5: Unders	stand about buffer ov	verflov	w attao	cks an	d Wireles	s Hacking Tecl	hniques.			
	UNIT– I									
Introduction to	Ethical Hacking									
Introduction, Et	hical hacking termin	ology	, Туре	es of h	acking te	chnologies, ph	ases of ethical h	acking		
Essential Term	inologies-Threat, A	Attack	x, Vuli	nerabi	ilities, Ta	rget of Evalua	tion, Exploit.			
			U	J <b>NIT</b> -	- II					
Foot printing										
Footprinting, Inf	ormation Gathering	Metho	odolog	v.Co	mpetitive	Intelligence, I	ONS Enumerati	on, Whois		
and ARIN Looku	ups, Types of DNS F	Record	ls, Ho	w Tra	ceroute Is	Used in Footp	rinting Contents	s, How E-		
Mail Tracking W	orks, Web Spiders V	Nork.	,			T	8	- ,		
Social Enginee	ring									
Social Engineer	ing, Types Of Attack	cs, Ins	ider A	ttacks	, Identity	Theft, Phishin	g Attacks, Onli	ne Scams,		
URL Obfuscation	n, Social-Engineerin	g Cou	interm	easure	es.					
			U	NIT-	III					
Sniffers										
Understand the	Protocols Susceptibl	e to S	niffin	g, Act	ive and Pa	assive Sniffing	, ARP Poisonin	g, Ethereal		
Capture and Dis	splay Filters, MAC F	Floodi	ng, Dl	NS Sp	oofing Te	chniques, Snif	fing Counterme	asures.		
Denial of Servic	ce		•	-	-	-	-			
Denial of Service	e, Types of DoS Atta	icks, I	How D	DoS .	Attacks W	ork, How BO	Гs/BOTNETs W	Vork,		
"Smurf" Attack,	SYN Flooding, DoS	/DDo	S Cou	nterm	easures.					
			U	<b>NIT</b> -	· IV					
Session Hijack	ing									
Spoofing vs. Hi	jacking, Types of Se	ssion	Hijacl	king, S	Sequence	Prediction, Ste	ps in Performin	g Session		
Hijacking, Desc	cribe How You Wou	ld Pre	vent S	ession	n Hijackin	g.	1	e		
SQL Injection					·	-				
SQL Injection,	Steps to Conduct SQ	L Inje	ection,	SQL	Server V	ulnerabilities, S	SQL Injection			
Countermeasure	Countermeasures.									
			J	UNIT-	- V					
Buffer Overflow	WS									
Different Types , Overview of B	of Buffer Overflow Suffer Overflow Mut	, Metl ation '	nods o Techn	f Dete iques.	ection, Ov	erview of Stacl	k-Based Buffer	Overflows		
Wireless Hacki	ng									
Overview of W	EP, WPA Authentic	ation 1	Mecha	nisms	, and Cra	cking Techniqu	ies, Wireless Sr	niffers and		
Locating SSIDs	, MAC Spoofing, Ro	ogue A	Access	s Point	s, Wireles	ss Hacking Tec	chniques, Metho	ods Used to		
Secure Wireless	s Networks.									

- 1. Kimberly graves "CEHOfficial Certified Ethical Hacker Review Guide," Wiley
- 2. MichealGregg, "Certified ethical hacker (CEH) Cert guide", Pearson education, 2014.

#### **Reference Books :**

- 1. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006.
- 2. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy", 2ed, Syngress Media, 2012.

#### Web References:

1. https://www.tutorialspoint.com/ethical\_hacking/ethical\_hacking\_pdf\_version.htm

## **Question Paper Pattern:**

#### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# PRINCIPLES OF PROGRAMMING LANGUAGES (PPL)

VI Semester: B	B.Tech						Scher	ne: 2017
<b>Course Code</b>	Category	Hours/Week			Credits	Maximum Marks		
OE313	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Ex	xam Duration: 2 Hr				End I	Exam Duration	n:3 Hrs	
<b>Course Outco</b>	omes: At the end of t	he c	ourse	stude	nts will be	able to		
CO1: Unders	stand the importance	of P	rograr	nming	g Language	s.		
CO2: Descri	be the syntax and sen	nanti	ics of	a prog	gramming l	anguage.		
CO3: Unders	stand programming c	onst	ructs a	and da	ta types.			
CO4: Develo	op Programs in Lisp a	und p	orolog					
CO5: Unders	stand and adopt a new	v pro	ogram	ming	language.			
				UNIT	I – I			
Dualiminanias								

#### Preliminaries

Reasons for studying concepts of programming languages, Programming domains, Language Evolution criteria, Influences on Language Design, Language categories, Language Design Trade-offs, Implementation methods, Programming Environments.

# UNIT-II

# Syntax and Semantics

Introduction, The general problem of Describing Syntax, Formal methods of describing syntax, Attribute Grammars, Describing the Meanings of programs-Dynamic Semantics, Lexical analysis, Parsing problem, Recursive Descent parsing, Bottom up parsing.

# UNIT-III

#### *Names, Binding, Type checking, Scopes and Data Types* Introduction, Names, Variables, The concept of binding, Type checking, Strong Typing, Type Compatibility, Scope, Scope and Lifetime, Referencing Environments, Named constants, Data types, Primitive data types, Character string types, User defined ordinal types, Array types, Associative arrays, Record types, Union types, Pointer and reference types.

#### UNIT-IV

# Functional Programming Languages

Introduction, Mathematical functions, Fundamentals of functional programming languages, LISP, An Introduction to Scheme, ML, Haskell.

#### UNIT-V

# Logic Programming Languages

Introduction, A brief introduction to Predicate calculus, Predicate calculus and Proving theorems, An Overview of logic programming, The origins of prolog, Basic elements of prolog, The deficiencies of prolog, Applications of logic programming.

1.Robert W. Sebesta, [Eighth Edition], "Concepts of Programming Languages", Addison Wesley, 2007.

# **Reference Books :**

1. Allen B Tucker, Robert E Noon,[2nd Edition],"Programming Languages, Principles & Paradigms", TMH.

# Web References:

1. https://cs.fit.edu/~ryan/cse4250/

# **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam

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# ADVANCED INFORMATION SYSTEMS (AIS)

VI Semester:	VI Semester: B. Tech					Scheme: 2017				
<b>Course Code</b>	Category	Ho	urs/W	Veek	Credits	Ma	ximum Marks			
OE314	Open Elective - 2	L 3	<b>T</b> 0	<b>P</b>	<b>C</b> 3	Continuous Internal Assessment 40	End Exam	<b>TOTAL</b> 100		
Sessional Ex	am Duration:2 Hrs	_	_			End	Exam Duratio	on:3 Hrs		
Course Outco CO1: Demo CO2: Interp CO3: Classif CO4: Summ CO5: Demon	omes: At the end of the onstrate the Object ories ret different types of In fy layer functionalities arize the concepts of i instrate different types	ne co ented nheri s of o nterr of pr	urse s conce itance OSI r networ rotoco	tudent epts. and P eferer rking, ls and	ts will be Polymorph ace model security web cont	able to iism and TCP Proto and IP address tents used in w	ocol suite ing zeb design			
Introduction to Object Oriented Concepts: Introduction, Programming Techniques, Introduction to Object Oriented Concepts, Concept of Structured Procedural Programming, Class, Object Characteristics of Objects: Data Abstraction, Classification, Encapsulation and Message Passing. Access Specifiers in Class, UML Class Diagrams.										
			U	J <b>NIT</b> -	- II					
Advanced Con Specifier, Mult Polymorphism, Introduction to Protocol Suite,	<i>cepts in Object Orie</i> iple and Multilevel I Implementation of OC <i>computer Networks</i> Routing Devices, Typ	inted Inher DC the Intes of	<i>t Tech</i> ritance hrough U roduce Netw	hnolog e, Ger h C++ NIT- tion, I vorks.	gy: Relat neralizatio <u>III</u> Network '	ionships, Inhe on and Specia Topology, OS	ritance- Protect lization, Abstra	ted Access act classes,		
			U	NIT-	IV					
Internetworking Networks, Virtua Network Securit	: Protocols for Interne al Private Network, W y: Authentication, Aut	twor orkii thori	king, ng of l zation	Intern Interno , Enci	et Addres et. cyption, S	s and Domains ecurity on Web	, Packets, Packe	xt Switched		
<i>Introduction to</i> Protocol (FTP), I Applications, Per	<i>Web Technology:</i> In Domain Name Server rformance of Web Ap	trod (DN plica	Uction S), W tions.	J <b>NIT</b> - , Hyp eb Ap	- V per Text 7 pplications	Fransfer Protoc s, Types of We	col (HTTP), Fi b Content, Mult	le Transfer i-Tier Web		

- 1. Campus Connect Foundation Programme Object Oriented Concepts System Development
- 2. Campus Connect Foundation Programme Computer Hardware and System Software Concepts, Programming Fundamentals- Vol. 1, INFOSYS.
- 3. Campus Connect Foundation Programme Relational Database Management System, Client Server Concepts, Introduction to Web Technologies Vol. 2, INFOSYS
- 4. E. Balaguruswamy, *Object Oriented programming with* C++, 2017
- 5. Data Communications & Networking, Forouzan, Tata McGrawHill, Fifth edition, 2017

#### **Reference Books :**

- 1. Herbert Schildt, The Complete Reference C++, McGraw Hill Education, Seventh Edition, 2017
- 2. M.P. Bhave and S.A. Patekar, *Object Oriented Programming with C++*, Pearson Education, 2008
- 3. Andrew S. Tenenbaum, Computer networks, Pearson education, Fifth edition, 2013

#### Web References:

- 1. https://www.tutorialspoint.com/cplusplus/
- 2. https://www.geeksforgeeks.org/computer-network-tutorials/

# **Question Paper Pattern:**

#### Sessional Exam

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#### End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10markseach. Each of these questions is from one unit and may contain sub-questions. i.e.; there will be two questions from each unit and the student should answer any one question.

#### Note:

- 1. Wireshark tool can be used to demonstrate ISO/OSI model in UNIT-III
- 2. Assignment Questions to be given from UNIT-II that maps POs like PO2, PO3.

# SCIENTIFIC PROGRAMMING WITH PYTHON (SCIPYP)

VI Semester:	VI Semester: B.Tech				Scheme: 2017					
<b>Course Code</b>	Category	Ho	urs/W	Veek	Credits	Credits Maximum Marks				
OE315	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2 Hrs					End	Exam Duratio	on:3 Hrs		
Course Outc	omes: At the end of th	ne co	urse s	tuden	ts will be	able to				
CO1: Under	stand fundamentals of	prog	gramn	ning –	variables,	conditions, Li	sts, Tuples & D	ictionaries.		
CO2: Unders	stand Arithmetic, Relation	onal,	Assig	nment	, Logical,	Bitwise, Memb	ership, Identity C	)perators		
CO3: Impart	Functions, Scope of v	varia	bles, N	Modul	es, Packag	ges.				
CO4: Compr	ehend Concepts of File	I/O,	Excep	tion H	landling, C	Classes and Obje	ects.			
CO5: Develo	op general scientific p	rogra	nmir	ng thro	ough Matr	olotlib, NumPy	and SciPy pack	ages.		
UNIT-I										
Introduction										
History of Python, Features, Advantages, Environment setup and Interaction using Command prompt,										
IDLE, Script me	IDLE, Script mode, IPython Notebook. <b>Basic Syntax:</b> Keywords Identifiers Variables									
Data Types: St	rings Numbers Boole	, vai	Date	s. and T	ime Lists	Tuples Dicti	onaries			
Dum Types. St	Dum Types. Strings, Ivanioers, Dooreans, Date and Time, Elsis, Taples, Diedonaries									
Operators: Ari	thmetic Operators, Co	ompa	arison	(Rela	tional) O	perators, Assig	gnment Operato	rs, Logical		
Operators, Bitw	ise Operators, Membe	ershi	p Ope	rators	, Identity	Operators.				
Conditional Sta	itements: 11, 11-el11-els	se								
<i>Loops:</i> for, wh	lle	<b>n</b> 00	C							
Connot Statem	enis. Dieak, continue	, pas								
				<u>NIT-</u>	· 111	( D	• • •	17 1		
Functions: Del	fining Functions, Calli	ng a	Funct	10n, F	unction A	rguments: Req	uired arguments	3, Keyword		
Statement Scot	pe of the Variables in s	ariat a Fui	nction	igin a	arguments bal and L	6, Anonymous	Functions, 1	ne Return		
Modules · Defi	ning module names	nacin	o Im	nortir	oar and L	es and module	e attributes fro	om Import		
statement. Mod	ule built-in functions.	Intro	oducti	on to $]$	Packages.	es and modul	e attributes, no	m. mpore		
	<u></u>		T.	INIT_	- IV					
Error and Exce	entions: Difference be	twee	en an e	error a	nd Except	tion Detecting	and Handling F	Exceptions		
Raising Except	ions, Assertions, Built	-in E	Except	ions.	User Defi	ned Exceptions	6	meeptions,		
Classes and Ob	jects: Overview of O	OP te	ermino	ology,	Creating	Classes, Creati	ng Instance Obj	jects,		
Inheritance, Ov	erriding Methods, Ove	erloa	ding N	Metho	ds, Opera	tors, Data hidi	ng.			
			J	U <b>NIT</b> -	- V					
Simple plotting	with pylab: Basic plo	otting	g, Lał	oels, le	egends an	d customizatio	n, More advanc	ed plotting		
Matplotlib: Matplotlib basics, Contour plots, heatmaps and 3D plots.										
NumPy: Basic	array methods, Readin	ng ar	nd wri	ting a	n array to	a file, Statistic	al methods, Pol	ynomial,		
Linear algebra,	Matrices, Random sa	mpli	ng, Di	iscrete	e Fourier t	ransforms				
SciPy: Physical	constants and special	Tun	ctions	, Integ	gration an	d ordinary diff	erential equatio	ns,		
General scient	pumization, data-mu	ing a	a poir	n-IIIC	nng. metic St	ability and cor	ditioning Prog	ramming		
techniques and	software development	Jaun t	5 POI	n ai i ti	mene, St	aomity and con	ionioning, 110g	amming		
coninques and	sortinare development	••								

1. Learning To Program With Python- 2011 Richard L. Halterman

2. Learning Scientific Programming with Python, Christian Hill, Cambridge University Press **Reference Books :** 

- 1. Python Programming-An Introduction to Computer Science 2nd edition-John Zelle 2010
- 2. Python The Ultimate Beginner's Guide!, Andrew Johansen
- 3. Core Python Programming, Wesley J. Chun, Pearson.

#### Web References:

- 1. https://www.tutorialspoint.com/python3/
- 2. https://realpython.com/

# Question Paper Pattern:

# Sessional Exam

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

# Note:

- 1. Python IDLE, Ipython notebook tools can be used to develop programs in UNIT-1 & UNIT-5.
- 2. Scope for develop type questions for assignment from UNIT-V

# **FUZZY LOGIC & NEURAL NETWORKS (FLNN)**

VI Semester : B.Tech			Scheme : 2017						
Course	<b>Course Category</b>	Hour	s/We	eek	Credits	Maxii	mum Marks		
Code							1		
OE316	Open Elective - 2	L	T	P	С	Continuous Internal Assessment	End Exam	TOTAL	
<b>G</b> • 11		3	0	0	3	40	<u>60</u>	100	
Sessional	Exam Duration: 2 H	the cour	maa ti	ha str	dont will h	Eng Exa	am Duration:	3 Hrs	
Course Outo	ones: At the end of		rse u	$\frac{100}{100}$	ural notwo	readie to			
CO2: To prov	vide adequate knowle	dge ab	out S	uper	vised Learn	ing feedback netw	orke		
CO3: To prov	vide adequate knowle	dge abo	out I	Insun	ervised Le	arning feedback net	etworks		
CO4: To teach about the concept of fuzziness involved in various systems and to provide adequate									
knowledge about fuzzy set theory									
CO5: To provide adequate knowledge of application in Neural Networks & fuzzylogic to real time									
systems.									
				UN	[ <b>T</b> – <b>I</b>				
Introduction	to Neural Networks	and its	Bas	sic Co	ncepts				
Biological ne	eurons and McCulloc	h and l	Pitts	mode	els of neur	on, Types of activ	ation function	ns, Neural	
networks arc	hitectures, Linearly	separat	ole a	ind li	nearly not	n-separable system	ns and their	examples,	
Features and	advantages of neur	al netw	vorks	s ove	r statistica	l techniques, Kno	owledge repre	esentation,	
learning proc	ess, error-correction	learning	g, co	ncept	s of superv	vised, learning, and	lunsupervised	llearning	
<i>a</i> • • • •	• • • • • • • • •			UNI	$\mathbf{T} - \mathbf{\Pi}$				
Supervised L	earning Neural Netw	vorks:		4					
Single layer	perception and mul	itilayer	perc	ceptro	on neural	networks, their a	Momontum	looming	
Concept of tr	algorithm, generalize	oss_vali	i Tur idati	on da	ta sets for <i>i</i>	design and validati	on of the Net	works	
Concept of u	anning, testing and er	035-van	luati				on of the ret	WOIK5	
Unsupervised	I Loarning Noural N	otwork	c •	UNI	1 – 111				
Competitive	Learning networks k	ohonen	s. self	-orga	nizing nety	vorks K-means an	d LMS algori	thms	
RBF neural n	etwork, its structure a	and Hv	brid	traini	ng algorith	m for RBF neural	networks. Co	mparison	
of RBF and M	/ILP networks Learni	ng, Hel	obiar	ı lear	ning, Hopf	ield networks.	· · · · · · · · · · · · · · · · · · ·	1	
		0,							
<b>F</b> 1 *				UNI	<b>I</b> – <b>I</b> V				
Fuzzy logic	agia theory gate and	their n		tion	Onarations	on fuzzy oot Euz	w relation on	4	
Dasic Fuzzy I	fuzzy relations and	vtonsic	roper	incin	Operations	s oli luzzy sel, Fuzz	zy relation and	l stic	
variables Fu	zzy rules and fuzzy re	easonin	σFu	ncipi	cation and	defuzzification and	d their method	sue ls Fuzzy	
inference syst	tems	asonn	5,10		cation and		a men memor	15, 1 <i>u</i> ZZy	
				UNI	<b>T</b> – <b>V</b>				
Applications	Applications:								
Applications	of Neural Networ	ks: Pat	ttern	class	sification,	Handwritten char	acter recognit	tion, Face	
recognition, Image compression and decompression									
Applications	of Fuzzy Logic &	Fuzzy	Syst	em:	Fuzzy patt	ern recognition, F	uzzy image p	rocessing,	
Simple applie	cations of Fuzzy kno	wledge	-bas	ed co	ntrollers li	ke washing machi	ines, traffic re	gulations,	
and lift control	bl								
Toyt Dealer									
1 Timothy I	Doce Euzzy Logic -	vith Eng	rinas	rina	Application	ng John Wilow on	Long III Ed	2010	
2 S Havkin	"Neural Networks	Comp	rehe	nsive	Foundatio	n" Pearson Educa	tion Inc. III I	Z010. Ed 2008	
2. 5. Haykill,	requial freeworks, P	r Comb		1131 V C	1 Junuario	, i carson Euuca		Ju 2000.	

3. Jacek. M. Zurada, "Introduction to Artificial Neural Systems", Jaico Publishing House, 2006.

4. LaureneFausett, Fundamentals of Neural Networks-Architectures, algorithms and applications, Pearson Education Inc., 2004.

- 5. J.S.R. Jang, C.T. Sun, E. Mizutani,, "Neuro Fuzzy and Soft Computing A computational Approach to Learning and Machine Intelligence", Pearson Education Inc., 2002..
- 6. Laurence Fausett, —Fundamentals of Neural Networksl, Pearson Education
- 7. Bart Kosko, —Neural networks and Fuzzy Systems", Pearson Education

# **Reference Books :**

- 1. S. Rajsekaran and G. A. Vijaylakshmi Pai, -Neural Networks, Fuzzy Logic, and Genetic Algorithms, PHI
- 2. N. Sivanandam, S. Sumathi, and S. N. Deepa, —Introduction to Neural Network Using MATLAB", Tata McGraw-Hill Publications
- 3. S.N.Sivanandam. M.PaulRaj, Introduction to Artificail Neural Networks, Vikas Publication House Pvt.Ltd, New Delhi.

# **Question Paper Pattern:**

#### Sessional Exam:

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

# End Exam:

Question paper contains Six questions; question 1 contains 5 short answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question

# **BUILDING INFORMATION MODELLING (BIM)**

VI Semester :							Schem	e:2017		
<b>Course Code</b>	Category	Ho	urs / W	Veek	Credits	Maximum Marks				
OE317	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	Total		
		1	2	-	3	40	60	100		
Sessional Exam D	uration: 2 Hrs					End Exa	m Duration	: 3 Hrs		
Course Outcomes: At the end of the course students will be able to										
CO1: Understand the basics of BIM and their applications										
CO2: Understand the usage of BIM tools and Toolbar										
CO4: Prepare ten	polates create basic y	ung a . volle	<u>SD III0</u> curtain		any resider	dit the walls l	ika divida	creating		
openings ef	te	wans,	cuitain	walls	and also e		ike uiviue,	creating		
CO5: Apply tools	like creating floors, r	oofs. v	valls, e	etc. in r	naking 3D	models of any	type of stru	cture.		
	0	, .	,.		0-	j	<b>71</b>			
			UNI	Г - І						
<i>Introduction:</i> The Basics of BIM - What is Revit? - Understanding a BIM Workflow – Leveraging BIM processes - Visualizing – Analyzing - Strategizing - Focusing Your Investment in BIM - Staffing for BIM - Understanding Project Roles - Establishing a BIM Execution Plan - Accessing and Using the Application Menu - Using the Quick Access Toolbar - Getting to Know the Ribbon - Defining Project Organization - Introducing Datum Objects (Relationships).										
			UNI	Г <b>- II</b>						
<i>The Basics of the Toolbox:</i> Selecting, Modifying, and Replacing Elements - Selecting Elements - Selection Options - Filtering Your Selection - Using Selection-based Filters - Selecting All Instances – Using the Properties Palette - Matching Properties – Using the Context Menu – Editing Elements Interactively - Moving Elements - Copying Elements – Rotating and Mirroring Elements - Arraying Elements - Scaling Elements - Aligning Elements - Trimming or Extending Lines and Walls - Offsetting Lines and Walls										
			UNIT	- III						
<i>Exploring Advanced Editing Tools:</i> Keeping Elements from Moving - Using the Join Geometry Tool - Using the Split Face and Paint Tools - Copying and Pasting from the Clipboard – Using the Create Similar Tool - Using Keyboard Shortcuts (Accelerators) - Double-click to Edit - Modelling Site Context - Using a Topo surface - Cut/Fill Schedules.										
UNIT - IV										
<b>Extended Modelling Techniques:</b> Creating Walls and Curtain Walls - Using Extended Modelling Techniques for Basic Walls - Creating Basic Wall Types - Adding Wall Articulation - Modelling Techniques for Basic Walls - Creating Custom In-Place Walls - Creating Stacked Walls - Creating Simple Curtain Walls - Designing a Curtain Wall - Dividing the Surface - Dividing the Surface with Intersects - Applying Patterns - Editing the Pattern Surface.										
<i>Configuring Temp</i> for Graphic Quality Patterns – Pre-confi – Saving Work - Sa	<i>lates and Standards:</i> y - Discovering Object iguring Colour Schem aving at Intervals.	Introc Styles nes - In	ducing s - Usin ncreasi	Projec ng Line ing Eff	t Template e Settings – icient view	es - Customizir - Defining Mate v Management	ng Project - erials - Defi - Organizin	Settings ning Fill g Views		

#### UNIT - V

*Modelling Floors, Ceilings, and Roofs:* Understanding Floor Types - Modelling a Floor - Creating a Structural Floor - Sketching for Floors, Ceilings, and Roofs - Modelling Slab Edges - Creating a Custom Floor Edge - Modelling Floor Finishes - Modelling Thick Finishes - Creating Ceilings - Creating a Roof by Face - Creating a Sloped Glazing - Using Slope Arrows - Using Additional Roof Tools - Using Advanced Shape Editing with Floors and Roofs.

#### **Text Books :**

- 1. Karen Kensek, Douglas Noble, Building Information Modelling: BIM in Current and Future Practice.
- 2. Danelle Briscoe [2015], *Beyond BIM Architecture Information Modelling*, Routledge Publication, ISBN: 9781317668107.

#### **Reference Books :**

- 1. Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston; *BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors*, John Wiley & Sons, Inc.
- 2. Bimal Kumar, A Practical Guide to Adopting BIM in Construction Projects.

#### Web References:

- 1. https://www.youtube.com/watch?v=LACe3vtc8dY
- 2. https://www.youtube.com/watch?v=LQdHkuG4do4

#### **Question Paper Pattern:**

#### **Sessional Exam:**

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question paper contains Six questions; question 1 contains 5 short answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question

# PRODUCT LIFE CYCLE MANAGEMENT (PLM)

VI Ser	mester:	B.T.	ech					Sche	eme : 2017
Cours	e Code	Category	Hours	s / We	ek	Credits	Maxi	mum Mar	ks
OE	2318	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
			3	-	-	3	40	60	100
Session	al Exam	Duration : 2 Hrs		4			End Exa	am Durati	on: 3 Hrs
						1			
Course	Outcome	s: At the end of the	course st	udents	s will	be able to	)		
<b>CO1</b> :	CO1: Understand basic concepts of Java such as operators, classes, objects, inheritance, packages Enumeration and various keywords								
<b>CO2</b> :	CO2: Understand product lifecycle management process & different steps in Product development process								
<b>CO3</b> :	Get know	wledge on Product da	ata mana	gemer	nt				
<b>CO4</b> :	Underst	and the implementation	on of PL	M and	l its i	mpact on t	he organization	1	
<b>CO5</b> :	Understa	and concept of PLM	architect	ure an	d inf	ormation a	uthoring tools		
	I			UNII	<b>-I</b>				
Introduction to Java (background, facts, editions), JVM, Program Structure (basics of class, object, member variables, methods, naming conventions, static, System), Installing Java, Setting PATH, Compiling & Running a minimal program. Primitive data types, cast, NaN, Two's complement, Variables (rules, types), Operators, Control Structures									
Arrays, and JDE	Construct 3C	ors, String class, Inh	eritance,	Packa	ages,	Access m	odifiers, Relatio	onal Datab	ases, SQL
			l	UNIT	– III				
PLM Introduction-Organization Business Models(MTS, MTO, CTO, ETO Etc), Basics of Enterprise Systems (PLM, ERP, MES), Background, Overview, Need, Benefits, and Concept of Product Life Cycle, Components / Elements of PLM, Emergence of PLM, Significance of PLM, Differences between PLM and PDM Integrated Product development process-Conceive-Specification, Concept design, Design- Detailed design, Validation and analysis (Simulation), Tool design , Realize-Plan manufacturing, Manufacture, Build/Assemble, Test(quality check) UNIT – IV									
PLM C	omponer	nts - Workflow Proc	esses, D	esign	Colla	aboration,	Processes Mar	nagement,	Document
Manage Configu	ment, Vi ration Ma	sualization, Bill of nagement, Manufact	Material uring Pro	ls (BC	DM) Mana	Managem agement, V	ient, Engineerii Variant Manager	ng Change ment, Class	e Control, sification.
	UNIT – V								

**PLM Technologies -** PLM Architecture, Various PLM tools, Data Modelling, Security management, CAD Integrations, Information authoring tools (e.g., MCAD, ECAD, Technical publishing), Core functions (e.g., data vaults), Data Flow to Other systems such as Supply chain and ERP systems

- 1. Grieves, Michael, Product Lifecycle Management, McGraw-Hill
- 2. Antti Saaksvuori, Anselmi Immonen, Product Life Cycle Management Springer
- 3. Kari Ulrich and Steven D. Eppinger, Product Design & Development, McGraw Hill

## **Reference Books:**

- 1. Java The Complete Reference (English) 9th Edition-herbert-schildt-Mcgraw Hill Education
- 2. Head First Java (English) 2 Edition- Kathy-Sierra-Publisher: O' Reilly
- 3. Burden, Rodger PDM: Product Data Management, Resource Publications

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

# End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e. there will be two questions from each unit and the student should answer any one question

# SIMULATION OF ENGINEERING SYSTEMS (SES)

VI Semester: B.Tech							Scheme	: 2017		
Course Code	Category	Ηοι	ırs/W	eek	Credits	Maxim	u <mark>m Mar</mark> l	ks		
OE319	Open Elective - 2	L	Т	Р	С	Continuous Internal Assessment	End Exam	Total		
		0	0	3	3	40	60	100		
Sessional Exam Duratio	on:2 Hrs					End Exam l	Duration	: 3Hrs		
Course Outcomes: At th	e end of the course st	udent	s will	be at	ole to					
<b>CO1</b> : Understand the bas	sic features and progra	ammir	ng in I	MAT	LAB.					
CO2: Understand control	l statements, function	s and j	plottir	ng in	MATLAB					
CO3: Understand develo	ping simulation mode	el usin	g sim	ulink	library.					
CO4: Understand the gra	phical user interface	in MA	TLA	B.						
CO5: Understand various tool boxes used in solving engineering problems.										
	Ι	UNI	T-I							
MATLABIntroduction to Simulation-Installation of MATLAB-History-UsEnvironmentMATLAB-Key features										
Environment	MATLAB-Key features.									
	Introduction to MATLAB Software- MATLAB window- Command window- Workspace-Command history-Current directory Setting-Basic commands-									
	Workspace-Command history-Current directory Setting-Basic commands- Assigning variables-Operations with variables.									
Data types and	Character and string- Arrays and vectors- Column vectors-Row vectors.									
Operators	Arithmetic Operators- Relational Operators-Logical Operators- Operator									
° Primors	Precedence- BODMAS Rules- Solving arithmetic equations.									
	Trigonometric functions. Complex numbers. Exactions & Dest surplus									
Basic Operations	Complex numbers	tions-	Con	plex	numbers-	- Fractions &	Real nu	mbers-		
		UNI	T-II							
MATLAB	Working with scrip	t tool	s- W1	iting	Script fil	e- Executing s	script file	es- The		
Programming	MATLAB Editor- o	penin	g and	savir	ig editor.					
	Creating M files, Sa	ving r	n-file	s- Eri	ors and W	arnings- Types	s of error	s- error		
	handling- MATLA	3 Deb	ugger	- Sett	ing Break	Points- Exami	ining Vai	riables-		
	line	de- er	laing	the d	edug sessi	on-Debugging	from co	mmanu		
	IIIIC.									
Loops and	Loops: for loop- ne	sted fo	or loop	p- wh	ile loop-					
Conditional	Branch Control St	tructu	re: if	con	trol staten	nents, switch s	tatement	- break		
Statements	statement- continue	stater	nent-	error	statement	t- try catch stru	icture- P	rogram		
	Termination — retu	rn								
Functions	Writing functions, V	Vriting	g user	defir	ed function	ons- Built in Fu	nction-F	unction		
	calling-Return Valu	e- Typ	pes of	Func	tions-Glol	bal Variables.				
	String Functions- In	put/O	utput	Func	tions.					
Plotting	Plots: Plotting vec	tor an	nd ma	trix	data- Plot	labeling, curv	ve labeli	ng and		
	editing.									
	<b>2D Plots:</b> Basic Pl	otting	Func	tions	-Creating	a Plot-Plotting	g Multipl	le Data		
	Sets in One Graph-	Specif	tying	Line	Styles and	d Colors- Grap	hing Ima	aginary		
	Controlling the Ave	rigure	winc nlote	iows-	uspiayin	g Multiple Plot	s in One	rigure-		
	<b>3Dnlots</b> • Use of me	sh orid	pious 1 fiine	tion_	Mesh nlo	t-Surface plot				
	Sepretes. Ose of file	SII EI N	a runc		THESH PIO	i Surface prot				

UNIT-III							
Simulink	Introduction to Simulink - Simulink Environment & Interface - Study of Library-						
	Object Oriented Design-Equation Oriented Design Fixed Step continuous						
	solvers- Variable step continuous solver- Data Import/ Export- Creating and						
	masking a Subsystem- Getting help for Simulink.						
	Simulation of Numerical Integration, Linear Algebra, Roots of						
	Polynomials, Algebraic equations, Differential Equations-Transforms						
	(Fourier, Laplace).						
Graphical User	Introduction of Graphical User Interface- GUI Function Property- GUI						
Interface Design	Roy Manu Designing, Creating a database Applications						
	Box- Menu Designing- Creating a database-Applications.						
Applications with	UNIT-V Image Processing: Importing and Visualizing Images Importing and						
Applications with MATLAR	displaying images. Converting between image types. Exporting images						
	Interactive Exploration of Images- Obtaining pixel intensity values- Extracting						
	a region of interest- Computing pixel statistics-Measuring object sizes.						
	MATLAB Applications in Control Systems. Neural Networks- Machine						
	Learning, Digital Signal Processing, Communication Systems and Fuzzy Logic						
	Systems.						
Text Books:							
1. Raj Kumar Bansal, A	shok Kumar Goel and Manoj Kumar Sharma, "MATLAB and its Applications						
in Engineering", Dorlin	g Kindersly India pvt. Ltd, Pearson, 5 <sup>th</sup> Edition 2012.						
2.Agam Kumar Tyagı, '	"MATLAB and Simulink for Engineers", Oxford University Press, 2 <sup>nd</sup> Edition,						
2012.	" "Introduction to MATLAD Programming Tool Day and Simulials"						
Juniversities Press 20	, introduction to MATLAB Programming, root Box and Simulink , $11.4$						
Reference Books:	/14.						
1. Misza Kalechman "	Practical MATLAB Basics for engineers" CRC Press Taylor & Francis group						
$1^{\text{st}}$ Edition, 2012.							
2.Rizwan Butt, "An Int	roduction to differential equations on MATLAB", Narosa Publishing house,						
2016.							
Web References:							
1.https://matlabacademy	y.mathworks.com/						
2. https://www.edx.org/	course/matlab-octave-beginners-epflx-matlabeoctavebeginnersx						
Question Paper Patter	n:						
Sessional Exam: The question paper for	sessional examination is for 20 marks, sovering helf of the cullebus for first						
sessional and remaining	that for second sessional exam Question No. 1 which carries 6 marks contains						
three short answer ques	stions of two marks each. The remaining three questions shall be EITHER/OR						
type questions carrying	8 marks each.						
End Exam							
Question paper contain	s Six questions; question 1 contains 5 short answer questions each of 2 marks.						
(Total 10 marks) cove	ering one question from each unit. The remaining five questions shall be						
EITHER/OR type quest	tions carrying 10 marks each. Each of these questions is from one unit and may						
contain sub-questions. i	e. there will be two questions from each unit and the student should answer any						
one question.							

# DATA SCIENCE with R (DSR)

VII Semester: B.Tech-CSE			Scheme: 2017						
<b>Course Code</b>	Category	Hou	irs/We	ek	Credits	Ma	ximum Marks		
CS411	Open Elective - 3	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL	
Sectional Ex	Dunation 2	<u> </u>	0	0	3	40 End E	00 vom Dunation	100 •2 Hag	
Sessional Ex	am Duration:2	nrs				Ella E		:5 HIS	
Course Outcomes: At the end of the course students will be able to CO1: Understand the analytical life cycle of a data science project CO2: Demonstrate the Basic Concepts of R Programming CO3: Apply various visualization methods for representation of results CO4: Organize the data for the modeling process CO5: Evaluate the quality of model UNIT-I Introduction to data science: The roles in a data science project. Stages of a data science project. Defining the goal. Data collection and									
management, Modelling, Model evaluation and critique, Presentation and documentation, Model deployment and maintenance.									
				UN	IT–II				
Understanding Operations Ope Data Frames in	Data Structures in erators and Types n R, Logical State	n R – , Hane ments	Lists, 1 dling N s in R,	Matric Aissing Lapply	es, Vectors g Values in I y, Sapply, V	Basic Building R, Subsetting V apply and Tapp	Blocks in R, B fectors in R, Ma bly Functions	asic atrices and	
	· · · ·			UN.	IT– III				
<b>Data Visualization using R:</b> Statistical models in R, Packages, A sample session. Introduction to graphical Analysis: Box-whisker plots, Scatter Plots, pair plots, Line charts, pie charts, Dot charts, Bar Charts.									
Loading data in	eto R:								
Working with data from files, working with well-structured data from files or URLs, Using R on less- structured data, Transforming data in R, Examining our new data. <i>Exploring data:</i> Using summary statistics to spot problems, Typical problems revealed by data summaries, Spotting problems using graphics and visualization. <i>Managing Data:</i> Cleaning Data, Data Transformations, Sampling for Modeling And Validation.									
UNIT-V									
Choosing and Evaluating models: Mapping problems to machine learning tasks, Solving classification problems, Solving scoring problems, Working without known targets, Problem-to-method mapping. Evaluating models: Evaluating classification models, Evaluating scoring models, Evaluating clustering models, Validating models, Linear and logistic regression, Data Analysis Case Study.									

1. Practical Data Science with R by Nina Zumel ,John Mount, Manning Publications,2016

2. R Programming for Data Science, by Roger D. Peng, https://leanpub.com/rprogramming

# **Reference Books :**

1. Hands-On Programming with R: Write Your Own Functions and Simulations by <u>Garrett</u> <u>Grolemund</u>

2. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition by <u>Hadley</u> <u>Wickham</u>, <u>Garrett Grolemund</u>

#### Web References:

1. www.r-project.org/about.html

2. www.dataquest.io

3. www.tutorialspoint.com/r/index.htm

## **Question Paper Pattern:**

#### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# **INTERNET PROTOCOLS (INP)**

VII Semester:	B.Tech						Sche	me: 2017		
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	lits Maximum Marks				
CS412	Open Elective - 3	L	T	P	C	Continuous Internal Assessment	TOTAL			
Sessional Ex	m Duration: 2	J Hrs	U	U	3	40 End F	00 vam Duration	• 3 Hrs		
Sessional Exc		1115						. 5 111 5		
Course Outco	mes: At the end	of the	course	stude	nts will be a	able to				
CO1: Summar	ize OSI and TCP/I	P refere	ence mo	odels.						
CO2: Unders	tand Sub netting	and Al	RP, RA	ARP P	rotocols					
CO3: Analyz	e Header format	of IPv4	4, Cheo	cksum	and ICMP	Protocol				
CO4: Compa	re TCP and UDP	Proto	cols							
CO5: Unders	tand HTTP, RTP	,RTCF	and II	Pv6 Pr	otocol					
				UNI	<b>T</b> – <b>I</b>					
Introduction: Inte	rnet administration	i, OSI r	nodel, '	TCP/IF	protocol an	d Addressing. IP	Addresses,			
Classful Addressin	g, Subnetting and	Supern	etting.							
				UNI	<u>Γ– ΙΙ</u>					
<i>Classless addressin</i> packet. ARP and R	ng: Variable length ARP protocols.	n block,	, Subne	ttting.	Delivery, for	rwarding and Rou	uting of IP			
				UNI	Г <b>– III</b>					
Internet Protocol:	Datagram. options	, check	sum. II	pack:	age. ICMP: 7	Types of message	s, Message Forn	nat, Error		
Reporting and Oue	rv.	,	~,	r		- JF 8-	-,8	,		
				UNI	Γ– <b>IV</b>					
<i>UDP and TCP</i> : F services, features, s	Process-to-process segment, connectio	commu on, flow	unicatio contro	on, use ol, error	er datagram, r control, coi	UDP operation, ngestion control,	UDP package. times, package.	ТСР		
				UNI	<b>Γ– V</b>					
	1.0.1.1.1.1							ID D .		

*HTTP, Multimedia and Private Networks*: HTTP architecture, web documents, RTP, RTCP, voice over IP, Private networks, Virtual networks, IPv6, ICMPv6, Transition from IPv4 to IPv6.

1. Behrouz A. Forouzan [2008], [3rd Edition], TCP/IP Protocol Suite, Tata McGraw Hill

#### **Reference Books :**

1. W.Richard Stevens, G.Gabrani [2001], TCP/IP Illustrated, The Protocols, Pearson Education.

2. S.Keshar [2007], [II Edition], An Engineering Approach to Computer Networks, Pearson Education

3. Douglas E Comer, Internetworking with TCP/IP, Pearson Education

#### Web References:

1. https://www.geeksforgeeks.org/computer-network-tcpip-model

2. http://www.steves-internet-guide.com/internet-protocol-suite-explained

3.https://www.tutorialspoint.com/data\_communication\_computer\_network

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions i.e there will be two questions from each unit and the student should answer any one question.
# DOT NET TECHNOLOGIES (DNT)

VII Semester:	B.Tech-CSE						Scher	me: 2017
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Max	imum Mark	S
CS413	Open Elective - 3	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	6	100
Sessional Exa	am Duration:2 Hrs					End Ex	am Duration	n:3 Hrs
~ ~ ~								
Course Outco CO1: Illustrat Consol	e the usage of loops, e based applications.	ne cou condi	tional	idents stater	s will be able nents, Array	e to ys, Functions and	l Structures u	ising
CO2: Explain	inheritance, polymo	rphisr	n usin	g clas	ses, objects	, interfaces, Colle	ections and C	benerics.
CO3: Underst	tand the working of N	Menus	, Butt	on, La	bel, Radio	Button, Checkbo	x, Text Box,	List Box,
Checke	e the features of SD	w, Tal	D Cont MDI a	rol us	ing Window	vs applications.		
CO5: Explain	the process of writing	ng ing	ort u	.ppnce	doloto and a	vindows forms.	using ADO	NET
	The process of with	ing ins	sert, uj	Juale	uerete anu s	select statements		.1112.1
•			1	JNIT	- I			
Introduction to C Flow control – Br Control structur Structures & Enur	C#: .NET Frameworl ranching & Looping. es in C#: Type conv merations, Functions	k, What ersion , Erro	at is C n – Imj r hanc	#, Wr plicit d lling.	iting a C# p & Explicit, (	rogram, Variable Complex variable	es and Expre e types- Arra	ssions ys,
			τ	J <mark>NIT</mark> -	- II			
Introduction to ( Defining classes,	<b>OOP using C#:</b> OOF Defining class members	P Tech bers –	nique Mem	s – In ber de NIT–	heritance, P finitions, Co	olymorphism, In ollections, Gener	terfaces, Eve ics – Using g	nts generics.
<b>Basic windows p</b> RichTextBox, Lis	rogramming: Contr stBox,CheckedListBo	ols – ] ox, Lis	Buttor stViev	n, Lab v, Tab	el, Link Lat Control.	el, TextBox, Rad	dio Button, C	TheckBox,
	• •			NIT-				1
Advanced windo Document Interfa	ce (MDI) application	Menus 1, Buil	ding l	ibars, MDI a	single Doci pplications		SDI), Multip	le
			U	J <b>NIT-</b>	- V			
<b>Introduction to</b> A Database program <b>ASP.NET</b> – Crea	ADO.NET and ASP ming with SQL SEF ting a simple page, S	<b>.NET</b> RVER Server	contro	D.NET	Г – Data Ac	cess components	S,	

- 1. Harsh Bhasin, Programming in C#, Oxfod University Press 2014, New Delhi.
- 2. Karli Watson, Christian Nagel, Jacob Vibe Hammer, Jon D.Reid, Morgan Skinner, Daniel Kemper, Beginning Visual C# 2012 Programming, Published by Jhon Wiley & sons, Inc.,
- 3. Dan Clark, Beginning C# Object Oriented Programming, New York, 2013, 2<sup>nd</sup> Edition.

## **Reference Books :**

1. John Sharp, Microsoft Visual C# 2013 Step by Step, Microsoft Press, Washington, 2013.

2. E.Balagurusamy, Programming in C#, Tata McGraw-Hill Publisher 2010, New Delhi, 3rd

#### Web References:

1. https://www.tutorialspoint.com

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

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# NATURAL LANGUAGE PROCESSING (NLP)

VII Semester	: B.Tech-CSE						Scl	neme: 2017
<b>Course Code</b>	Category	Hou	rs/W	/eek	Credits	Ma	ximum Marks	
CS414	Open Elective - 4	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional E	Exam Duration:2 Hrs	5				End	Exam Duratio	on: 3 Hrs
Carrie Ord	a a mage At the and of	41				a abla ta		
Course Out	comes: At the end of rstand different I evel	$\frac{1}{1}$ s of N	Jurse	al Lar	oulage An	e able to		
CO2: Outli	ne Phonological Rule	s and	Tran	sduce	rs	lary 515.		
CO3: Ident	ify N-grams for a give	en Na	tural	Lang	uage.			
CO4: Analy	vze Speech Recognitio	on Alg	goritl	nms.				
CO5: Exam	nine Parsers and featur	res of	Grai	mmar	S.			
			Oru	UN				
Introduction	to Natural Language	Unde	rstan	ding	• The study	ofLanguage	Applications of	Natural
Language Un	derstanding Evaluati	no la	noua	σe Π	nderstandi	ng Systems T	he different Le	evels of
Language Ana	alysis, Representation	s and	Und	erstar	nding.			
				UNI	T– II			
Morphology	and Finite-State T	<b>rans</b> a	lucer	rs: S	urvey of	English Mor	phology, Finit	te-State
morphologica	l parsing.							
Computation	al Phonology and Te	xt-to-	Spee	ech: S	peech Sou	unds and Phone	etic Transcripti	on, The
phoneme and	phonological Rules	, Pho	nolo	gical	Rules and	d Transducers,	Machine lear	ning of
Phonological	Rules.							
				UNI	Γ– III			
N-grams: Cou	unting words in corpo	ra, sin	nple	(unsn	noothed) N	-grams, smootl	ning, back off, I	Deleted
Interpolation,	N-grams for spelling	and P	ronu	nciati	on, entrop	ру.	-	
				UNI	T– IV			
HMMs and Sp	peech Recognition: S	peech	Rec	ogniti	ion Archit	ecture, Overvie	w of Hidden M	larkov
models, The V	viterbi Algorithm Rev	isited.	, Adv	vance	d method f	for decoding, A	coustic Process	sing of
Speech. comp	uting Acoustic Probab	oilities	s, Tra	aining	a Speech	Recognizer		U
				UNI	<b>T</b> – <b>V</b>			
Grammar and	d Parsing: grammars	s and	sente	ence	structure,	what makes a	good grammar	A top-

Down Parser, A Bottom-Up Parser, Transition Network Grammar.

*Featured and Augmented Grammars:* Feature Systems and Augmented Grammars, some basic featured systems for English, Morphological Analysis and the lexicon, A simple grammar using Features, parsing with features.

- 1. "Speech and Language Processing" by Daniel Jurafsky and James H Martin, Pearson Education Second Edition.
- 2. "Natural Language Understanding" by James Allen, Pearson Education Second Edition.

#### **Reference Books :**

- 1. Thomas M. Cover and Joy A.Thomas, Elements of Information Theory, Wiley.
- 2. Charniak .E, Statistical Language Learning, The MIT Press.

## **Question Paper Pattern:**

### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

#### End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question.

# HUMAN COMPUTER INTERACTION (HCI)

VII Semester:	B.Tech-CSE						Sc	cheme: 2017		
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS415	Open Elective-4	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	Elective-4	3	0	0	3	40	60	100		
Sessional Ex	am Duration: 2	Hrs				End E	xam Duration:	3 Hrs		
Course Outco CO1: Unders CO2: Unders CO3: Analyz CO4: Select a CO5: Identif	omes: At the end stand the important stand Human chara ze and organize v and apply system l by and apply prop	of the nce an acterist arious evel u er dev	e cours id prine ics, Hu eleme ser inte ice bas	e stud ciples uman in ents of erface of sed cor	ents will be of User Inte nteraction de application components. ntrols, testin	able to rface design. sign process. level screen. g methods of u	ser interface.			
				TT	NIT_ I					
Introduction Importance of user Interface – definition, importance of good design, Benefits of good design. A brief history of Screen design. The Graphical User Interface Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface. UNIT– II Design Process Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business functions										
				UN	IT–III					
Screen Designi Design goals – S – screen naviga – presentation i Technological c	<i>ng</i> Screen planning a tion and flow – V nformation simpl consideration in in	ind pu isually ly and nterfac	rpose, y pleas mean ce desi	organi sing co ingfull gn. UN	izing screen mposition – ly – informa	elements, order amount of info ation retrieval o	ing of screen da rmation – focus n web – statisti	ata and content and emphasis cal graphics –		
System Menus										
Structures of Me Windows New and Navig Components – t	enus, Functions of gation schemes se ext and messages	f Menu electio s, Icon	us, Cor on of v s and i	vindov	f Menus, Kin v, selection ses – Multin	nds of Graphica of devices base nedia, colors, us	l menus. ed and screen b es problems, ch	ased controls. loosing colors.		
Controls				U	NTT-V					
Characteristics Entry/Read-only controls. <i>Testing</i> The purpose an	of device based c y controls, Selec d importance of	ontrol tion c usabil	s, Sele ontrols	ecting t s, Cor ting, S	the proper d nbination E cope of test	evice based con ntry/selection c ting, Prototypes	trols, Operable controls, Selecti , Kinds of Test	controls, Text ng the proper s, Developing		
	ine test.									

- 1. Wilbert O Galitz, The essential guide to user interface design, 2<sup>nd</sup> Edition. Wiley, India, 2009
- 2. Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale, Human Computer Interaction, 3<sup>rd</sup> Edition, Pearson Publishers, 2008.

#### **Reference Books :**

- 1. Ben Shneidermann(2008), Designing the user interface, 4<sup>th</sup> Edition, Pearson Education Asia.
- 2. Rogers, Sharps, Prece (2013), Interaction Design 3<sup>rd</sup> Edition, Wiley, India.
- 3. Soren Lauesen (2005), User Interface Design, Pearson Education.
- 4. Human Computer Interaction, Smith-Atakam, Cengage Learning.
- 5. Human Computer Interaction, I. Scott Mackenzie, Elsevier Publishers.

#### Web References:

- 1. https://nptel.ac.in/courses/106103115/
- 2. https://www.interaction-design.org/literature/topics/human-computer-interaction
- 3. http://ps.fragnel.edu.in/~dipalis/prgdwnl/eguid.pdf
- 4. https://www.tutorialspoint.com/human\_computer\_interface/quick\_guide.htm

## **Question Paper Pattern:**

## Sessional Exam

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## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

## Note:

- 1. Microsoft Visual Basic/ JBuilder, Sketch, Invision Studio, Figma and Framer X etc. tools can be used to demonstrate User interface screens in UNIT-III & IV.
- 2. Faculty can assess student's analysis / design skills by making them to design user interface for a given application in UNIT-III & IV.

# SOFTWARE QUALITY AND TESTING (SQT)

VII Semester:	<b>B.Tech-CSE</b>						Sch	eme: 2017
Course Code	Category	Hour	s/Week	<b>X</b>	Credits	Ma	ximum Marks	1
		_				Continuous		
CS416	Open	L	T	P	C	Internal	End Exam	TOTAL
	Elective-4	2	0	0	2	Assessment	60	100
Sessional Ex	am Duration:2	Hrs	0	0	5		Exam Duratio	n:3 Hrs
Course Outc CO1: Under	omes: At the end stand the basic co	of the oncepts	course of soft	studen ware te	ts will be	able to		
CO2: Classi high-c	fy the types of so quality software	oftware	testing	to poi	int out the	importance of	testing in achie	eving
CO3: Use th	ne various testing	technic	ques of	a softv	ware system	m		
CO4: Compa	are the traditional	softwa	re testi	ng and	l web base	d testing		
CO5: Extend	the Quality cond	cepts ar	nd Metr	ics for	the Softw	are Quality		
<b>T</b> ( <b>T</b> ( <b>C</b>				UNI	<b>T– I</b>			
Introduction to Introduction, E Testing, Psycho Effective Softw as a Process, So	Software Testing volution of Soft ology for Softwa vare Testing vs. E oftware Failure Ca	g: ware T re Test Exhausti ase Stud	esting, ting, Sc ive Soft dies.	Softw oftware tware '	vare Testir e Testing Testing, E	ng—Myths and Definitions, M ffective Testin	d Facts, Goals lodel for Softw g is Hard, Softw	of Software are Testing, vare Testing
				UNI	Γ <b>– ΙΙ</b>			
Software Testin Verification an Requirements, Validation.	ng Terminology, <i>nd Validation:</i> V Verification of Hi	Softwa erificat igh-leve	re Testi ion and el Desig	ng Lif Valid gn, Ve	fe Cycle (Sation (V&	STLC), Softwar V) Activities, of Low-level D	re Testing Meth Verification, Verification, Ve	odology. erification of Verify Code?
				UNIT	'– III			
Testing Techni	ques:							
Dynamic Testin Testing, State T Error Guessing. White-Box Test Graph Matrices	ng: Black-Box T Table-Based Testi ting Techniques . Loop Testing.	T <i>esting</i> ng, Deo Need o	<i>Techni</i> cision T f White	<i>ques</i> H `able-H e-Box '	Boundary Based Test Testing, L	Value Analysis ting, Cause-Eff ogic Coverage	s (BVA), Equiv ect Graphing B Criteria, Basis	valence Class ased Testing, Path Testing,
	, F 8.			UNIT	<b>IV</b>			
Testing Web-bas	sed Systems:			01111				
Web-based Syste in Testing for V Systems.	em, Web Technol Web-based Softw	ogy Ev are, Qı	olution ality A	, Tradi Aspects	itional Sof s, Web Ei	tware and Web	-based Software ebe), Testing o	e, Challenges f Web-based
				UNI	Γ– V			
Software Quality Software Quali Quality Control Factors, Method	y Management: ty, Broadening th and Quality Assu ds of Quality Mar	ne Cono urance, nageme	cept of Quality ent, Soft	Quality Mana ware (	ty, Quality agement (Q Quality Me	y Cost, Benefit QM), QM and F etrics, SQA Mo	s of Investmen Project Manager odels.	t on Quality, nent, Quality

- 1. Software Testing Principles and Practices, Chauhan, Oxford University Press
- 2. Software Testing, Yogesh Singh, University Press.

#### **Reference Books :**

- 1. Software Testing and Quality Assurance, Theory and Practice A JOHNWILEY & SONS, INC., PUBLICATION by *KSHIRASAGAR NAIK*
- 2. Fundamentals of Software Testing, AB Mathur, Pearson

#### **Question Paper Pattern:**

#### Sessional Exam:

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#### **End Exam:**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

#### Note:

- 1. Selenium is the latest testing tool can be used to demonstrate the Web Based System in UNIT-4.
- 2. For UNIT-3 we have problems to solve and assignment questions

# ADVANCED COMPUTER ARCHITECTURE(ACA)

V Semester: B	.Tech-CSE						Sc	cheme: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks					
CS307	Professional Elective	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
		3	0	0	3	40	60	100			
Sessional Exa	m Duration:2 H	rs				End E	xam Duration:	3 Hrs			
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to					
CO1: Unders	tand the concept	of par	allel p	rocess	ing, classifi	cation schemes	and memory ac	ldressing			
schem	es in parallel pro	<u>cessin</u>	<u>g syste</u>	ems.	1	•					
CO2: Apply	the concept of Pi	pelini	ng in fi	unctio	n evaluation	using reservat	ion table.				
CO4: Understand the SIMD array structures, algorithms for array processors and SIMD											
<b>CU4:</b> Understand the SIMD array structures, algorithms for array processors and SIMD											
Interconnection networks.											
the imr	the importance of data flow computers over control flow computers.										
			I			I					
				U	NIT– I						
Introduction to	parallel processi	ing:									
Trends towards parallel processing, parallelism in uniprocessor systems, parallel computer structures,											
architecture classification schemes, memory hierarchy in parallel processing systems.											
UNIT-II Pipelining:											
Pipeline concep Nonlinear pipe	ot, Linear pipelin line and Reservat	ing an ion ta	d spac ble, In	e time structi	diagram, Clon and Arith	lassification of metic pipeline	pipe line proces s.	ssor,			
				UN	IT–III						
Principles of d	lesigning pipelin	e pro	cessor	s:							
Instruction pre- register tagging	fetch and Branch g, Hazard detection	hand on and	ling, D resolu	Data bu ution, J	offering and ob sequenci	Busing structuing and Collision	res, Internal for prevention.	rwarding and			
				UN							
SIMD Array I	Processors:			UI							
SIMD structures and algorithms for array processors, organization, masking and routing mechanisms, inter processor communication, parallel algorithms for array processors (matrix multiplication and parallel sorting).											
<b>SIMD interconnection network</b> : Single stage and Multistage network, Cube network, Barrel shifter, shuffle exchange and Omega networks.											
UNIT– V											
Multiprocesso characteristics, memories, mul	r architecture: I interconnection tistage network.	Loosel	ly coup rk, tim	oled an eshare	id tightly con d or commo	upled multiproo on busses, cross	cessor systems, bar switch and	processor multi-port			
Data flow con graphs and lang driven approac	nputers: Control guages, Data flow hes.	flow and d	Vs D esign a	ata flo ilterna	ow, Data flo tives-Depen	ow computer an idency driven ap	rchitectures, Da pproach and Mu	ta flow. Iti level			

1.Kai Hwang, Faye Briggs [2017], "Computer architecture and parallel processing", ISBN 10: 125902914X ISBN 13: 9781259029141 Publisher: Mc Graw Hill India, 2017

2.Kai Hwang (2017), Advanced Computer Architecture-Parallelism, Scalability, Programmability, McGraw Hill.

#### **Reference Books:**

1.David E. Culler, J. P. Singh, Anoop Gupta, Harcourt Asiam, Morgan Kaufmann (1999), Parallel 2.V. Rajararnan, C. Siva Ram Murthy (2000), Parallel Computers - Architecture and Programming, Prentice Hall of India, New Delhi.

#### Web References:

1. https://nptel.ac.in/courses/108105118/25

2. https://nptel.ac.in/courses/117106111/23

3. https://nptel.ac.in/courses/117104128/5

4.https://www.tutorialspoint.com/parallel\_computer\_architecture/

#### **Question Paper Pattern:**

### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### **End Exam:**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# Artificial Intelligence (AI)

V Semester: B	<b>S.Tech-CSE</b>						S	cheme: 2017	
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks	5	
CS308Professional ElectiveLTPCContinuous Internal AssessmentEnd ExamTC300340605									
Sessional Ex	am Duration:2	Hrs				End E	xam Duration	:3 Hrs	
Course Outc CO1: Recog CO2: Descri CO3: Solvin deeper CO4: Solve a functio CO5: Under	omes: At the end nize how foundat be the nature, Str g agent's problem ing, Bidirectiona agent's problems ons. stand the biologic	of the ions la ucture ns by l Sear by Gi cal neu	e cours aid for and B using F ch Stra reedy, <i>J</i> ural net	e stude Artific ehavio Breadt itegies A *, M	ents will be cial Intellig our of agent h, Depth, U femory bou c. NIT– I	able to ence. s in the environ niform, Depth- nded heuristic s	ment. limited, Iterativ earch strategies	ve s, heuristic	
What Is AI?, The Intelligent Age Agents and Environment	ne Foundations of <i>nts</i> vironments, Good	f Artif	icial In	tellige UN The C	ence, The H NIT– II Concept of R	istory of Artific Rationality, The	ial Intelligence Nature of Envi	ronments,	
The Structure o	of Agents.			UN	IT– III				
Solving Problem Problem-Solvin	<i>ns by Searching</i> g Agents, Examp	le Pro	blems,	Searc	hing for So	lutions, Uninfo	rmed Search Str	rategies.	
<i>Informed (Heur</i> Greedy best-firs Functions.	<b>ristic) Search Str</b> st search, A* sear	<i>ategie</i> <sup>.</sup> ch, M	s emory	-bound	ded heuristi	ic search, learni	ng to search be	tter. Heuristic	
				UN	NIT– V				
Artificial Neura Neural network networks, Learni Nonparametric 1	<i>al Networks</i> structures, Sing ing in multilayer Models: Nearest	gle-la <u>y</u> netwo neigh	yer fee rks, Le bour r	ed-forv earning nodels	ward neura g neural net , Finding 1	l networks, Mu work structures. nearest neighbo	ultilayer feed-f	forward neural rees, Locality-	

sensitive hashing, Nonparametric regression.

- 1. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third Edition,
- 2. Yegnanarayana, B. "Artificial neural networks". PHI Learning Pvt. Ltd., 2009

### **Reference Books:**

- 1. "Artificial Intelligence", 2nd Edition, E.Rich and K.Knight (TMH).
- 2. Judea Pearl, "Probabilistic Reasoning in Intelligent Systems", Morgan Kaufmann, 1988.
- 3. "Introduction to Artificial Intelligence", Rajendra Akerkar; Prentice Hall of India, 2005.

### Web References:

- 1. https://www. https://medium.com/
- 2. https:// https://ai.google/education/
- 3. http:// http://www.opennn.net/

## **Question Paper Pattern:**

## Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

## **COMPUTER GRAPHICS (CG)**

V Semester: B	.Tech-CSE						S	cheme: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks	Scheme: 2017num MarksEnd ExamTOTAL60100m Duration: 3 Hrs			
CS309	CS309 Professional		Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
<b>Elective</b> 3 0 0 3 40 60 100											
Sessional Ex	am Duration:2	Hrs				End E	xam Duration	:3 Hrs			
Course Outc CO1: Unders CO2: Unders CO3: Unders	omes: At the end stand line drawing stand display devi stand two dimensi	of the algor ces an onal t	e cours ithms a id poly ransfor	e stud and ciu gon fi matio	ents will be rcle generati lling algorit ns.	able to ng algorithms. hms.	on algorithms				
CO5: Unders	stand Curve gener	ation	and Co	olor m	odels		in argontininis.				

#### UNIT-I

Introduction: Applications of computer graphics, Points, Lines, Pixels and Frame buffer, Primitive operations, Screen grid coordinates, Normalized device coordinates, Line drawing algorithms-DDA and Bresenham, Midpoint circle algorithm, Antialiasing techniques.

## UNIT-II

Display Devices: CRTs, Raster scan systems, Random scan systems, Color CRT monitor, Flat panel displays, Graphics input devices, Types of polygons, Inside-Outside test (odd-even, winding number methods), Scan-line polygon fill, Boundary fill, Flood fill algorithms.

#### UNIT-III

2D Transformations: Types of transformations- Coordinate transformations, Geometric transformations, Basic transformations- Translation, Scaling, Rotation, Homogeneous coordinates, Compound transformations-Reflection, Shearing, Transformations about arbitrary points & lines.

#### UNIT-IV

Windowing and Clipping: Window, Viewport, Viewing transformation, Clipping-Cohen Sutherland line clipping, Sutherland Hodgeman polygon clipping algorithms. 3D transformations, 3D object representations, Hidden surfaces & lines, Back face detection & removal- Z-buffer, Painter's algorithms.

## UNIT-V

Curves: Introduction, Curve generation, Interpolation, Bezier curve Algorithm. Color models: RGB, YIQ, CMY, HSV, HLS.

- 1. Donald Hearn and M. Pauline Baker [2007], Computer Graphics C Version II edition, Eastern Economy Edition.
- 2. Steven Harrington [2006], Computer Graphics, A programming approach, MGH.

#### **Reference Books:**

- 1. David F. Rogers [2008], [II Edition], Procedural elements of Computer Graphics, Tata
- 2. Xiang Zhigang and Plastock Roy A [2003], [Schaum"s outline of Theory and problems of Computer Graphics, [II Edition], Computer Graphics.
- 3. W. M. Newman & R. F. Sproull [1997], [II Edition], Principles of Interactive Computer Graphics, Tata McGraw Hill Co.
- 4. F.S. Hill, Stephen M kelley, Computer Graphics using OPENGL, Third edition, Prentice
- 5. Computer Graphics, Sinha & Udai, TMH

#### Web References:

- 1. https://nptel.ac.in
- 2. https://www.sanfoundry.com/
- 3. https://www.geeksforgeeks.org/computer-graphics

# **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# MOBILE APPLICATION DEVELOPMENT (MAD)

V Semester: B	.Tech-CSE						Sch	neme: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks					
CS310	Professional Elective	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
		3	0	0	3	40	60	100			
Sessional Ex	am Duration:2	Hrs		1		End E	xam Duration	:3 Hrs			
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to					
CO1: Unders	stand Android OS	5, Ecli	pse ID	E, And	droid SDK a	nd tools.					
CO2: Unders	stand Activities, I	Fragm	ents ar	nd Inte	nts in Andro	oid Apps.					
CO3: Apply	different Layout	s in A	ndroid	Apps	•						
CO4: Design	an Android App's	s User	Interfa	ce.							
CO5: Apply	options menus ar	nd cor	itext m	enus.							
				UN	IT-I						
Getting Started What is Android Application	d? Obtaining Req	uired '	nming Tools,	Creatio	ng First And	roid Applicatio	n, Anatomy of a	an Android			
				UN	IT–II						
Activities, Frag Understanding A Using Intents, D	<i>ments and Inten</i> Activities, Linkin isplaying Notifica	ts g Acti ations	vities	Using	Intents, Frag	gments, Calling	g Built-in Appli	cations			
				UN	IT– III						
Android User I Components of Utilizing the Act	<i>nterface</i> a Screen, Adaptin ion Bar, Creating	ng to I g the U	Display Jser Int	v Orier terface	ntation, Man Programma	aging Changes atically	to Screen Orie	ntation,			
				UN	IT–IV						
<i>Designing User</i> Using Basic Vie Fragments	• Interface with V ws, Using Picker	/ <i>iews</i> Views	s, Using	g List V	Views to Dis	play Long Lists	s, Understanding	g Specialized			
				UN	IT–V						
Displaying Pict	ures and Menus	With	Views								
TT ' T - T7'			<b>TT</b> •	3.6	.1 17	G 4.11	. 1 3 7				

Using Image Views to Display Pictures, Using Menus with Views, Some Additional Views

- 1. Wei-Meng Lee, Beginning Android 4 Application Development 2015
- 2. Barry Burd, Android Application Development All-In-One for Dummies, Second Edition 2015

#### **Reference Books:**

- 1. John Horton, Android Programming for Beginners 2015
- 2. Rick Boyer, Kyle Mew, Android Application Development Cookbook, Second Edition 2016

#### Web References:

- 1. https://www.tutorialspoint.com/android/index.htm
- 2. https://www.javatpoint.com/android-tutorial
- 3. https://developer.android.com/

## **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

# **DISTRIBUTED SYSTEMS (DS)**

Course Code         Category         Hours/Week         Credits         Maximum Marks           CS316         Professional Elective         L         T         P         C         Continuous Internal Assessment         End Exam         TOTAL           Sessional Exam Duration: 2 Hrs         End Exam Duration: 3 Hrs         End Exam Duration: 3 Hrs         Course Outcomes: At the end of the course students will be able to         CO2: Describe Client Server Model, Communication Methods of Distributed System         CO3: Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System           CO4: Summarize the concepts of Threads, Processor Allocation Algorithms         CO5: Understand Distributed File System Design with Implementation           CO5: Understand Distributed Systems:         Introduction, Examples of Distributed Systems           Resource Sharing and the Web, Challenges.         System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations           Nodel, Security Model.         UNIT- II           Communication in Distributed Systems         Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V           Colect Sognehronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronization in Distributed Systems           Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, use of synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronization: Lo	VI Semester :	<b>B.Tech-CSE</b>						Scl	neme: 2017
CS316       Professional Elective       L       T       P       C       Continuous Internal Sessesment       End Exam       TOTAL         Sessional Exam Duration:2 Hrs       3       0       0       3       40       60       100         Sessional Exam Duration:2 Hrs       End Exam Duration:3 Hrs       End Exam Duration:3 Hrs         Course Outcomes: At the end of the course students will be able to CO1: Understand the models and design requirements of distributed systems.       CO2:         C02: Describe Client Server Model, Communication Methods of Distributed System       CO3:       Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System         C04: Summarize the concepts of Threads, Processor Allocation Algorithms       CO5:       Understand Distributed File System Design with Implementation         C05: Understand Distributed Systems: Introduction to Distributed Systems: Introduction, Examples of Distributed Systems       System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction         Model, Failure Model, Security Model.       UNIT- II         Communication in Distributed Systems       Client-Server model.         Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues.         Synchronization: in Distributed Systems       UNIT- II <td><b>Course Code</b></td> <td>Category</td> <td>Hou</td> <td>irs/We</td> <td>ek</td> <td>Credits</td> <td>Ma</td> <td>ximum Marks</td> <td></td>	<b>Course Code</b>	Category	Hou	irs/We	ek	Credits	Ma	ximum Marks	
Sessional Exam Duration:2 Hrs       End Exam Duration:3 Hrs         Course Outcomes: At the end of the course students will be able to       CO1: Understand the models and design requirements of distributed systems.         CO2: Describe Client Server Model, Communication Methods of Distributed System       CO3: Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System         CO4: Summarize the concepts of Threads, Processor Allocation Algorithms       CO5: Understand the models and the System Set and Design with Implementation         CO5: Understand Distributed Systems:       Introduction, Examples of Distributed Systems         CO5: Understand Distributed Systems:       Introduction, Examples of Distributed Systems         Resource Sharing and the Web, Challenges.       System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations         Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction       Model, Failure Model, Security Model.         Communication in Distributed Systems       UNIT-II         Communication in Distributed Systems       Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V         unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model.       Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues.         VINIT- III       Synchronization: Logical clocks, physical clocks, clock synchronization	CS316	Professional Elective		T	P	C	Continuous Internal Assessment	End Exam	TOTAL
Sessional Exam Duration: 2 Hrs         End Exam Duration: 5 Hrs           Course Outcomes: At the end of the course students will be able to         CO1: Understand the models and design requirements of distributed systems.           CO2: Describe Client Server Model, Communication Methods of Distributed System         CO3: Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System           CO4: Summarize the concepts of Threads, Processor Allocation Algorithms         CO5: Understand Distributed File System Design with Implementation           UNIT-1         Introduction         Introduction, Examples of Distributed Systems: Introduction, Examples of Distributed Systems           Resource Sharing and the Web, Challenges.         System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations           Models: Introduction, Architectural Models.         Software Layers, System Model.         Interaction           Model, Failure Model, Security Model.         UNIT- II         Communication in Distributed Systems         Interactive Interactive Model.           Client-Server Model:         Clients & Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Ys unreliable Primitives, Implementing client-server model.         Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues.           Clock Synchronization in Distributed Systems         Clock Synchronization algorithm, distributed algorithm, token ring algorithm.	Segmentel		3 []	0	0	3	40 End E		100
Course Outcomes: At the end of the course students will be able to CO1: Understand the models and design requirements of distributed systems. CO2: Describe Client Server Model, Communication Methods of Distributed System CO4: Classify Clock Synchronization, Muttual Exclusion, Deadlocks in Distributed System CO4: Summarize the concepts of Threads, Processor Allocation Algorithms CO5: Understand Distributed File System Design with Implementation UNIT-I Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT-II Communication in Distributed Systems Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT- II Synchronization in Distributed Systems Clock Synchronization is cleaced algorithm, distributed algorithm, token ring algorithms, use of synchronized clocks. Mutual Exclusion: Centralized algorithm, distributed algorithm, token ring algorithm. Dead Locks: Distributed deadlock detection and prevention. UNIT- IV Processes and Processors in Distributed Systems Threads-Introduction, Archads usage, design issues for processor allocation algorithms, implementatio issues for processor allocation algorithms, example processor allocation algorithms, implementatio issues for processor allocation algorithms, example processor allocation algorithms, implementatio issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation alg	Sessional Ex	am Duration:2	Hrs				Ena E	xam Duration	:5 Hrs
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CO2: Describe Client Server Model, Communication Methods of Distributed System CO3: Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System CO4: Summarize the concepts of Threads, Processor Allocation Algorithms CO5: Understand Distributed File System Design with Implementation UNIT-1 Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT- II Communication in Distributed Systems Client-Server Model: Clients & Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT- II Synchronization in Distributed Systems Clock Synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronization: Centralized algorithm, distributed algorithm, token ring algorithm. Dead Locks: Distributed Gystems Threads-Introduction, metads, begin issues, implementing a threads package, threads and RPC Processor Allocation Allocation models, design issues for processor allocation algorithms, implementatio sisues for processor allocation algorithms, example processor allocation algorithms, implementation Sustems Cost System Servers Servers Servers CUNIT- V Distributed File System Design: File service interface, directory service interface, semantics of file sharing. Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	CO1: Under	stand the models	and de	esion r	equire	ments of dis	tributed system	IS	
CO3: Classify Clock Synchronization, Mutual Exclusion, Deadlocks in Distributed System CO4: Summarize the concepts of Threads, Processor Allocation Algorithms CO5: Understand Distributed File System Design with Implementation UNIT-I Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT-II Communication in Distributed Systems Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Vs unreliable primitives, Implementing Client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT-III Synchronization in Distributed Systems Clock Synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronized clocks. UNIT-IV Processes and Processors in Distributed Systems Threads-Introduction, threads usage, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation issues for processor allocation algorithm	CO2: Descri	be Client Server	Mode	l. Com	munic	ation Metho	ds of Distribute	ed System	
CO4: Summarize the concepts of Threads, Processor Allocation Algorithms CO5: Understand Distributed File System Design with Implementation UNIT-1 Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT- II Communication in Distributed Systems Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffred Primitives, reliable Vs unreliable primitives, Implementing client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT- III Synchronization in Distributed Systems Clock Synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronized clocks. Mutual Exclusion: Centralized algorithm, distributed algorithm, token ring algorithm. Dead Locks: Distributed deadlock detection and prevention. UNIT- IV Processors in Distributed Systems Threads-Introduction, threads usage, design issues for processor allocation algorithms, implementation issues for processor allocation models, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms. UNIT- V Distributed File System Design: File service interface, directory service interface, semantics of file sharing. Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	CO3: Classi	fy Clock Synchro	nizati	on, Mu	itual E	Exclusion, D	eadlocks in Dis	tributed Systen	1
CO5: Understand Distributed File System Design with Implementation UNIT-I Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT- II Communication in Distributed Systems Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT- III Synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronization: Centralized algorithm, distributed algorithm, token ring algorithm. Dead Locks: Distributed Systems Threads-Introduction, Allocation models, design issues for processor allocation algorithms, implementation UNIT- IV Processor Allocation-Allocation models, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms, implementation UNIT- V Distributed File System Design: File service interface, directory service interface, semantics of file sharing. Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	CO4: Summ	arize the concept	s of T	hreads	, Proce	essor Alloca	tion Algorithm	s	
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UNIT-1 Introduction to Distributed Systems: Introduction, Examples of Distributed Systems Resource Sharing and the Web, Challenges. System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model. UNIT- II Communication in Distributed Systems Client-Server Model: Clients &Servers, addressing, blocking Vs non-blocking primitives, buffered V unbuffered primitives, reliable Vs unreliable primitives, Implementing client-server model. Remote Procedure Call: Basic RPC operation, parameter passing, dynamic binding, RPC semantics in presence of failures, implementation issues. UNIT- III Synchronization in Distributed Systems Clock Synchronization: Logical clocks, physical clocks, clock synchronization algorithms, use of synchronized clocks. Mutual Exclusion: Centralized algorithm, distributed algorithm, token ring algorithm. Dead Locks: Distributed deadlock detection and prevention. UNIT- IV Processes and Processors in Distributed Systems Threads-Introduction, threads usage, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms. UNIT- V Distributed File System Design: File service interface, directory service interface, semantics of file sharing. Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.				2	Ę	·			
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Dead Locks: Distributed deadlock detection and prevention.         UNIT-IV         Processes and Processors in Distributed Systems         Threads-Introduction, threads usage, design issues, implementing a threads package, threads and RPC         Processor Allocation-Allocation models, design issues for processor allocation algorithms, implementation issues for processor allocation algorithms, example processor allocation algorithms.         UNIT-V         Distributed File System Design: File service interface, directory service interface, semantics of file sharing.         Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	Mutual Exclusion	on: Centralized al	lgoritt	nm. dis	tribute	ed algorithm	token ring alg	orithm	
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UNIT – V         Distributed File System Design: File service interface, directory service interface, semantics of file sharing.         Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	issues for proces	sor allocation alg	orithr	ns, exa	mple	processor all	location algorit	hms.	.p
<b>Distributed File System Design:</b> File service interface, directory service interface, semantics of file sharing. <b>Implementation:</b> File usage, system structure, caching, replication. Trends in Distributed File System.	1		·						
sharing. Implementation: File usage, system structure, caching, replication. Trends in Distributed File System.	Distributed File	System Design.	File	ervice	interf	11-V	ry service inter	face comantia	of file
	sharing. Implementation	: File usage, syste	em str	ucture,	, cachi	ng, replicati	on. Trends in D	Distributed File	System.

- 1. Andrew S. Tanenbaum, Distributed Operating System, Pearson Education.
- 2. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems- Concepts and Design", Fourth Edition, Pearson Publication.

#### **Reference Books:**

- 1. Mukesh Singhal, Niranjan G. Shivaratri, Advanced Concepts in Operating Systems.
- 2. Sinha, Distributed Operating System: Concepts and Design, PHI

#### Web References:

- 1. <u>https://www.e-reading.club/book.php?book=143358</u>
- 2. <u>http://www.ia.pw.edu.pl/~tkruk/edu/rso.b/lecture/pre/rso01\_pre.pdf</u>

#### **Question Paper Pattern:**

#### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### **End Exam:**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# MULTIMEDIA AND ANIMATION (MAA)

VI Semester:	B.Tech-CSE						Sch	eme: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks				
CS317	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	Elective	3	0	0	3	40	60	100			
Sessional Ex	am Duration:2	Hrs				End E	xam Duration:	3 Hrs			
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to					
CO1: Unders	stand the basic co	mpon	ents of	a mul	timedia proj	ject.					
CO2: Unders	stand the usage of	f text a	and for	mats i	n multimedi	a.					
CO3: Unders	stand the audio di	gitiza	tion, au	ıdio fi	le format an	d audio softwar	re.				
CO4: Unders	stand the colour,	image	, image	e form	ats and Corr	rection in multi	media.				
CO5: Under techniques.	<b>CO5:</b> Understand the digital video standards, formats and basic principles behind animation and techniques.										
				TIN	тт т						
Introduction to N	Jultimadia Wha	tiam	ltimo		mnonanta o	f multimadia V	Wab and Interna	t multimadia			
applications, Transition from conventional media to digital media.											
				U	NIT– II						
Computer Fonts bitmap fonts In	and Hypertext: U ternational charac	Jsage eter se	of tex ts and l	t in N Nyperto	Iultimedia, I ext, Digital f	Families and fation fat	aces of fonts,	outline fonts,			
				U	NIT– III						
Audio fundamen	tals and represent	ations	: Digiti	zation	of sound. fr	equency and bar	ndwidth, decibe	l system. data			
rate, audio file fo Adding sound to	ormat, Sound synt	hesis, proje	MIDI, ct, Aud	wavet lio sof	able, Compr tware and ha	ession and trans ardware.	smission of audi	o on Internet,			
				U	NIT– IV						
Image fundamer 2D Graphics, In Basic Image Pro Gamma correction	ntals and represent nage Compression cessing, Use of in on, Photo Retoucl	tations n and nage e ning.	s: Colo File Fo editing	ur Scie ormats softwa	ence, Colour :GIF, JPEG are, White ba	, Colour Model , JPEG 2000, I llance correction	s, Colour palette PNG, TIFF, EX n, Dynamic rang	es, Dithering, IF, PS, PDF, ge correction,			
				UN	IT– V						
Video and Anim video, Video Rea Video compress Animation: Cell	/ideo and Animation: Video Basics, How Video Works, Broadcast Video Standards, Analog video, Digital video, Video Recording and Tape formats, Shooting and Editing Video, Video Compression and File Formats. /ideo compression based on motion compensation, MPEG-1, MPEG-2, MPEG-4, MPEG-7, MPEG-21, Animation: Cell Animation, Computer Animation, Morphing.										

- 6. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, 2008.
- 7. Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication, New Delhi, 2007.
- 8. Li & Drew, "Fundamentals of Multimedia", Pearson Education, 2009.

### **Reference Books :**

- 1. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007.
- 2. Anirban Mukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.

#### Web References:

- 1. https://www.wisdomjobs.com/e-university/multimedia-tutorial-270.html
- 2. http://www.multimediatrainingvideos.com/
- 3. https://www.tutpad.com/tag/multimedia

## **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

# SERVICE ORIENTED ARCHITECTURE & WEB SERVICES (SOA & WS)

VI Semester:	B.Tech-CSE						Sche	eme: 2017
Course Code	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks	
CS318	Professional Elective	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
Sessional Ex	am Duration • 2 ]	) Hrs	0	0	3	40 End F	00 vam Duration	100 •3 Hrs
		115				End		.5 1115
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to		
CO1: Unders	stand software orio	ented	archite	ctures.				
CO2: Design	medium scale so	ftware	e proje	ct deve	elopment usi	ing SOA princip	ples.	
CO3: Develo	p SOA messages	from	busine	ss use	cases.			
CO4: Design	and implementat	tion of	mode	rn SOA	A and SOA-	specific method	lologies, techno	logies and
CO5: Create	composite servic	es hv	annlvii	ng con	nosition sty	le		
		cs by	appiyn		iposition sty	ie.		
				UN	IT–I			
Introduction To	SOA, Evolution	Of SC	DA: Fu	ındam	ental SOA;	Common Char	acteristics of co	ontemporary
SOA; Common	tangible benefits	of SC	DA; A	n SOA	timeline (f	rom XML to V	Veb services to	SOA); The
continuing evol	ution of SOA (S	tanda	rds or	ganiza	tions and C	Contributing ve	ndors); The roo	ots of SOA
(comparing SOA	A to Past architect	ures).		TIN				
Wah Sarviaas a	nd Primitivo SO	$\Lambda \cdot Th$	o Wol		an framou	vorke Sorvigas	(as Wab sorvio	og): Sorvigo
descriptions (with Web Services a Atomic Transact Web Services an	the WSDL); Messa nd Contemporary tions; Business ac nd Contemporary	ging ( SOA tivitie	with S A - I s; Orch -2: Ad	OAP). Messagnestrati dressir	ge exchange ion; Choreog ig; Reliable	e patterns; Serv graphy. messaging; Co	vice activity; Co	oordination; es; Metadata
exchange; Secur	ity; Notification a	nd ev	enting.					
				UN	IT–III			
Principles of Ser architecture; Co Service orientati	vice - Orientation mmon Principles on and object orie	n: Ser of S entatio	vices o ervice n; Nat	orienta orient ive We	tion and the ation; How eb service su	enterprise; Ana service orienta pport for service	atomy of a serv ation principles we orientation pr	ice oriented interrelate; inciples.
				UN	IT–IV			
Service Layers: layer, Business scenarios.	Service orientatic service layer, Ore	on and chestra	conter ation s	mpora ervice	ry SOA; Ser layer; Agno	vice layer abstrostic services;	raction; Applica Service layer co	tion service.
				UN	<b>IT- V</b>			
Business Process process design; V SOA Platforms:	3 Design: WS-BPl WS addressing lar SOA platform bas	EL lan nguage sics; Se	iguage e basic OA suj	basics s; WS pport i	; WS Coord Reliable Me n J2EE; SOA	ination overview essaging langua A support in. ET	w; Service orien ge basics. ; Integration cor	ted business

- 9. Thomas Erl, Service-Oriented Architecture: Concepts, Technology and Design, Prentice Hall Publication, 2005.
- 10. Michael Rosen, Boris Lublinsky, Applied SOA Service Oriented Architecture and Design Strategies, Wiely India Edition, 2008.

### **Reference Books :**

- 3. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, —Java Web Services Architecture, Elsevier, 2003.
- 4. Ron Schmelzer et al. XML and Web Services, Pearson Education, 2002.
- 5. Frank P.Coyle, —XML, Web Services and the Data Revolution, Pearson Education, 2002.

#### Web References:

- 4. https://www.service-architecture.com
- 5. http://www.opengroup.org/soa/source-book/soa/p1.htm
- 6. https://www.javatpoint.com/service-oriented-architecture

## **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

# PATTERN RECOGNITION (PR)

VI Semester :	B.Tech -CSE						Sche	me: 2017	
Course Code	Category	Hou	rs/We	ek	Credits	Maximum Marks			
CS319	Professional Elective	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL	
Sessional Ex	$ram Duration \cdot 2$	J Hrs	U	U	5	Fnd F	vam Duration	• 3 Hrs	
Sessional Ex		1115						. 5 1115	
Course Outc	omes : At the end	l of th	e cour	se stud	lents will be	able to			
CO1: Summ	narize on supervis	ed and	d unsu	pervis	ed classifica	tion methods for	or various patte	rn	
recog	nition problems.								
CO2: Comp	are various cluste	ring t	echniq	ues of	unsupervis	ed learning.			
CO3: Under	rstand various stru	ictura	l patter	n reco	gnition mo	dels.			
CO4: Outlin	the reature extraction	on and	a subse	et selec	ction metho	ds for various a	pplications.	:C	
COS: Analy	ze the neural netv	VORKS	for pa	ttern re	ecognition p	problems and FU	izzy Pattern Cla	assiners.	
				UN	T _ I				
Pattern Classif	ïor			UIU					
Parametric estin algorithm – LM functions – Min Unsupervised ( Clustering for Hierarchical cl clustering solut	mation – Maximu ISE algorithm – P nimum distance pa Classification unsupervised lean ustering procedu ions.	m like proble: attern ming res –	elihood ms wit classif and cl Graph	l estim h Bayo ïer. UNI assific n theo	ation – Bay es approach T – II ation – Clu retic approa	esian paramete – Pattern class stering concep ach to pattern	r estimation – F ification by dist t – C-means a clustering – V	Perceptron ance Igorithm – Validity of	
				UNI	Γ–III				
<i>Structural Patt</i> Elements of fo description – Pa	ern Recognition rmal grammars - arsing – Stochasti	- Strin c grar	ng gen nmars	eration and ap	n as pattern plications –	description – Graph based s	Recognition o tructural repres	f syntactic entation.	
Foature Extrac	tion and Selectio	n		UNI	1-11				
Entropy minim approximation	nization – Karhu Binary feature s	<i>n</i> nen – electi	- Loev on.	e tran	sformation	– Feature sele	ection through	functional	
D ( 4 1				UNI	1 – V				
Neural network Unsupervised la pattern classifie	<i>es</i> k structures for earning in neural ers – Pattern class	Patter Patter ificati	n Rec n Reco on usin	ognitio ognitic 1g Ger	on – Neura on – Self-org netic Algorit	al network bas ganizing networ hms.	ed Pattern ass rks – Fuzzy log	sociators – gic – Fuzzy	

- 1. Robert J.Schalkoff, "Pattern Recognition Statistical, Structural and Neural Approaches", Wiley, India, 2009.
- 2. M. Narasimha Murthy and V. Susheela Devi, "Pattern Recognition", Springer 2011
- 3. Sergios Theodoridis, Konstantinos Koutroumbas, "Pattern Recognition & Matlab Introduction", Fourth edition, Acadamic press, 2010

#### **Reference Books :**

- 1. Andrew R. Webb, Keith D. Copsey, "Statistical Pattern Recognition", Third Edition, Wiley, 2011.
- 2. Duda R.O., Har P.E., and David G Stork, "Pattern Classification", Second edition, John Wiley & Sons, NewYork, 2012.
- 3. S.N. Deepa, S.N. Sivanandam, "Principles of Soft Computing", Second Edition, Wiley, 2012.
- 4. Tou and Gonzales, "Pattern Recognition Principles", Wesley Publication Company, London, 1974.

#### Web References:

- 1. https://www.mathworks.com/discovery/pattern-recognition.html
- 2. https://www.igi-global.com/book/pattern-recognition-classification-time-series/147125
- 3. https://www.mathworks.com/discovery/pattern-recognition.html

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

# **DESIGN PATTERNS (DP)**

VI Seme	ster : B.Tech CSE			<b>Scheme: 2017</b>						
Course	Category	<b>Hours/Week</b>			Credits	Ma	Maximum Marks			
						Continuous				
	Professional	L	Т	Р	С	Internal	End Exam	TOTAL		
CS320	Flective					Assessment				
	LIECTIVE	3	0	0	3	40	60	100		
Sessional	Exam Duration: 2 Hrs	1				E	nd Exam Dura	ation: 3 Hrs		
Course (	Course Outcomes: At the end of the course students will be able to									
<b>CO1:</b> Understand the usage of design patterns for solving object oriented design problems.										
<b>CO2:</b> De	scribe the creational patte	erns a	lbstrac	et facto	ory, factory	method, build	ler, prototype, a	and singleton.		
<b>CO3:</b> Un	derstand structural patter	ns: a	dapter	, bridg	ge, composi	ite, decorator, t	facade, fly weig	ght, proxy.		
<b>CO4:</b> Ex	plain behavioral patterns	chair	n of re	sponsi	bility, com	mand, interpre	eter, iterator, m	ediator,		
me	emento, observer, state, st	trateg	y, ten	plate	method, an	d visitor.				
CO5: Ex	plain the patterns used in	n solv	ring de	esign p	problems of	f Lexi Docume	ent Editor.			
				U	NIT– I					
Design P	attern Introduction									
What Is a	a Design Pattern, Descri	bing	Desig	n Pat	terns, the C	Catalog of Des	sign Patterns, O	Organizing the		
Catalog, I	How to Select a Design P	atterr	ı, Hov	v to Us	se a Design	Pattern, How	Design Pattern	s Solve Design		
Problems					Ū.		C	0		
				UN	IT–II					
Creation	al Patterns		_	_		_		_		
Abstract	Factory Pattern, Builder	Patter	m, Fac	ctory N	Method Pat	tern, Prototype	e Pattern, Single	eton Pattern.		
				UN	IT– III					
Structura	ıl Patterns									
Adapter I	Pattern. Bridge Pattern. C	Compo	osite F	Pattern	. Decorator	r Pattern, Faca	de Pattern, Flv	weight Pattern.		
Proxy Par	ttern.	1			,	,	, ,	0,		
				UN	IT– IV					
Behavior	al patterns			011	'					
Chain of	responsibility Pattern, C	omm	and P	attern.	Interpreter	r Pattern, Itera	tor Pattern, Me	diator Pattern.		
Memento	Pattern, Observer Patte	ern, S	State I	Pattern	. Strategy	Pattern, Temp	plate method F	Pattern, Visitor		
Pattern.	,	,			, 0,	, I		,		
				UN	IT–V					
A Case S	tudy									
Designing	g a Document Editor, De	sign	Proble	ems, D	ocument S	tructure, Form	atting, Embelli	shing the User		
Interface,	Supporting Multiple L	ook-a	nd-Fe	el Sta	ndards, Su	pporting Mult	tiple Window	Systems, User		
Operations Spelling Checking and Hyphenation.										

- 1. Erich Gamma [2008], Design Patterns elements of reusable object oriented software, Pearson Education.
- 2. Frank Buschmann, RegineMeunier, Hans Rohnert, Peter Sommerlad, Michael Stal, Pattern-Oriented Software Architecture: A System of Pattern, John Wiley & Sons; 1996.

#### **Reference Books :**

- 1. Mark Grand, Pattern's in JAVA Vol-I, Wiley DreamTech.
- 2. Mark Grand, Pattern's in JAVA Vol-II, Wiley DreamTech.
- 3. Mark Grand [2006], JAVA Enterprise Design Patterns Vol-III, Wiley DreamTech.
- 4. Eric Freeman-Oreilly-spd, Head First Design Patterns.
- 5. Alan Shalloway, Design Patterns Explained, Pearson Education.

#### Web References :

- 1. https://sourcemaking.com/design\_patterns
- 2. https://www.oodesign.com/

## **Question Paper Pattern**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question.

# ADVANCED DATABASE MANAGEMENT SYSTEMS (ADBMS)

VI Semester: B.Tech-CSE							Se	cheme: 2017			
Course Code	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks				
CS321	Professional Elective		T	P	C	Continuous Internal Assessment	End Exam	TOTAL			
Sectional Ex	am Duration.2	3 Una	0	0	3	40 End E	00 vom Duration	100 2 Um			
Sessional Exam Duration: 2 Hrs End Exam Duration: 3 Hrs											
Course Outc	omes. At the end	of the	e cours	e stud	ents will be	able to					
CO1: Summarize the basic concepts of object-based databases.											
CO2: Explain different database system architectures and concepts of parallelism in databases.											
<b>CO3:</b> Illustrate the concepts of distributed databases.											
CO4: Expla	in the automated in	nform	ation re	etrieval	l systems.						
CO5: Outlin	e the concepts of	trans	actions	s in da	tabases.						
	Ĩ										
Object Based D	atabases			U	NIT–I						
Complex data types, Structured types and Inheritance in SQL. Table inheritance, Array and Multiset types in SQL, Object identity and reference types in SQL, Implementing O-R features. Persistent programming languages, Object-Oriented v/s Object relational.											
				U	NIT– II						
Database System Centralized and Parallel Databa	<i>m Architecture</i> Client–server are <i>ises</i>	chitec	tures, S	Server	system arc	hitectures, Paral	llel systems.				
Introduction, I/C Inter operation	O parallelism, Int parallelism, Desig	er que gn of j	ery para paralle	allelis l syste	m, Intra que ems.	ery parallelism,	Intra operation	parallelism,			
				UN	JIT_III						
<b>Distributed Databases</b> Homogeneous and Heterogeneous databases, Distributed data storage, Distributed Transactions, Commit protocols, Concurrency control in distributed databases, Availability, Distributed query processing, Heterogeneous distributed database.											
				UN	NIT– IV						
Information–retrieval systems Overview, Relevance ranking using terms and Hyperlinks, Synonyms, Homonyms and Ontologies, Indexing of documents, Measuring retrieval, effectiveness Web search engines, Information retrieval and Structured data											
				U	NIT-V						
Advanced Tran Transaction pro systems, Long of	esaction procession cessing, Monitor duration transaction	<b>ng</b> s, Tra ons, T	nsactio Transac	onal we	orkflows, N nanagement	lain memory da in Multi databa	tabases, Real ti ses.	me transaction			

1. Henry F. Korth & Abraham Silberschatz,6<sup>th</sup> edition [2017], *Database System Concepts* **Reference Books :** 

#### **Keterence Books** :

- 1. Ramez Elmasri, Navathe [2009], Fundamentals of Database systems.
- 2. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw Hill, 2009

#### Web References:

- 1. http://www.exploredatabase.com/2014/03/advanced-dbms-topics.html
- 2. <u>https://www.tutorialspoint.com/distributed\_dbms/</u>
- 3. https://dsinghpune.wordpress.com/advanced-database-management-system/

## **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

## **SOFT COMPUTING(SC)**

VI Semester: 1	B.Tech-CSE			Scheme: 2017					
<b>Course Code</b>	Category	Hours/Week			Credits Maximum Marks				
CS322	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
	Elective	3	0	0	3	40	60	100	
Sessional Exa			End E	xam Duration	3 Hrs				

Course Outcomes: At the end of the course students will be able to

**CO1:** Design the perceptron model using supervised learning.

**CO2:** Design the associative memory networks and hamming networks.

**CO3:** Understand the classical sets, fuzzy sets, classical relation and fuzzy relation.

**CO4:** Understand the techniques for fuzzification, defuzzification and fuzzy arithmetic.

**CO5:** Understand the operators used in genetic algorithm.

## UNIT-I

Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies of ANNs. Supervised Learning Networks: Perceptron Networks, Adaptive Linear Neuron, Back propagation Network.

## UNIT-II

Associative Memory Networks: Training Algorithms for pattern association Auto associative Memory, Bidirectional Associative Memory (BAM), and Hopfield Networks.

**Unsupervised Learning Network:** Introduction, Fixed Weight Competitive Nets, Maxnet, Mexican Hat Net, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks.

## UNIT-III

**Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets:** Introduction, Classical Sets (Crisp Sets), Fuzzy Sets, Classical Relations - and Fuzzy Relations - Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.

## UNIT-IV

Membership functions- Features, Fuzzification, membership value assignments, Defuzzification

Fuzzy Arithmetic and Fuzzy Measures: Fuzzy arithmetic, Extension principle, Fuzzy measures

## UNIT-V

**Genetic Algorithm:** Introduction, Basic Terminologies in Genetic Algorithm, Operators in Genetic Algorithm –Encoding, selection, Crossover and Mutation, Applications.

- 1. S.N.Sivanandam, S.N.Deepa "Priciples of Soft Computing" WILEY Second Edition 2013
- 2. S. Rajasekaran & G.A. Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic, and Genetic Algorithms synthesis and application", 2011, PHI.

#### **Reference Books :**

- 1. S.R. Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing" First Edition, 2015 Pearson Education.
- 2. Saroj Kaushik, Sunita Tewari, Soft computing: Fundamentals, Techniques and applications, First Edition, 2018, Mcgrawhill.
- 3. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", Third edition (2011), Wiley.

#### Web References:

- 1. https://swayam.gov.in/course/4574-introduction-to-soft-computing
- 2. https://tutorialspoint.com/artificial\_neural\_network/artificial\_neural\_network\_pdf\_version.htm

#### **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain subquestions. i.e there will be two questions from each unit and the student should answer any one question.

## **COMPUTER SIMULATION & MODELLING (CSM)**

VI Semester: J	B.Tech-CSE						Sc	cheme: 2017	
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks			
CS323	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
	Licetive	3	0	0	3	40	60	100	
Sessional Ex	am Duration:2 I	Hrs				End E	xam Duration:	:3 Hrs	
Course Outcomes: At the end of the course students will be able toCO1: Understand the characteristics and models of computer simulation.CO2: Describe Monte Carlo Inventory Simulation and Random Number Generation.CO3: Explain characteristics of queueing models.CO4: Summarize the concepts of Simulation languages GPSS, SLAM, GEMS, SIMSCRIPT, IFPSCO5: Understand model and syntax of GPSS.									
<u> </u>				UNI	T– I				
Introduction to basic concepts an applications of si Monto Carlo In	Computer Simulation.	ation: imple	Defin simula	ition, ation r UNI	types of mo nodel, uses T– II	odels, characteri of simulation, li	stics of mather ife cycle of sim	matical model, ulation model,	
<i>Monte Carlo In</i> inventory model.	ventory Simulat.	<i>ion</i> : 1	Basic 1	nvent	ory concept	ts, fixed order	quantity model	l, monte carlo	
Random Number methods, statistic	er Generation:	Prope: mnes	rties, 1 s, testir	metho ng ran	ds for gene dom numbe	erating random	numbers, dig 1 pc versions of	ital computer basic.	

## UNIT-III

*Simulating queuing models*: Basic terminology, simple queuing system, approaches to queuing problems, important characteristics of queuing system, simulating tool crib operation.

### UNIT-IV

*Special Purpose Simulation Languages:* Advantages & disadvantages of simulation languages, selection criteria of simulation language.

Simulation Languages: GPSS, SLAM, GEMS, SIMSCRIPT, IFPS, current trends in simulation languages.

## UNIT-V

*General Purpose Simulation System (GPSS)*: Introduction, elementary concepts in GPSS, nature of a model, transactions, facilities, structure of a model, syntax of a GPSS, storage and some SNAS.

1. Hugh j. Watson, John H. Blackstone(jr), *Computer Simulation*, Second Edition, 1989, Wiley Publications.

2. KRV Subramanian and Sundaresan, System Simulation and Introduction to GPSS, 1997, CBS Publications.

#### **Reference Books:**

- 1. Frank L. Severance, System Modeling and Simulation, Wiley, 2001.
- 2. Averill M. Law and W. David Kelton, *Simulation Modeling and Analysis*, Third Edition, McGraw Hill, 2006.

#### Web References:

1. https://nptel.ac.in/courses/112107220/2

#### **Question Paper Pattern:**

#### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# ADHOC AND SENSOR NETWORKS (ASN)

VII Semester:	<b>B.Tech-CSE</b>						Sch	neme: 2017	
Course Code	Category	Hou	ırs/We	ek	Credits	Ma	Iaximum Marks		
CS407	Professional Elective	L 3	<b>T</b>	<b>P</b>	C 3	Continuous Internal Assessment 40	End Exam	TOTAL	
Sessional Ex	am Duration:2 l	Hrs	U	Ū	5	End E	xam Duration	:3 Hrs	
Course Outc	omes: At the end	of the	e cours	e stud	ents will be	able to			
CO1: Explain sensor	n the concepts, ne networks.	etworl	k archit	tecture	es and applic	cations of ad ho	c and wireless		
CO2: Descri	be MAC protocol	ls of a	id hoc	wirele	ss networks.				
CO3: Explai	n characteristics,	desig	n issue	s and	classification	n of routing and	l transport layer	r protocols	
in ad f	oc wireless netw	Orks.	fWSN	alono	with MAC	protocols for W	WSNs		
CO5: Under	stand routing issu	$\frac{1}{100}$	calizati	ion and	$\frac{1000}{1000}$ in W	SN	v 51v5.		
	stand routing issu	03,10	canzan			511.			
				UNI	T– I				
Radio propagatic mobile ad hoc r Applications of A MAC Protocols MAC Protocols, Contention based	on Mechanisms, G networks (MANE Ad Hoc and Sense for Ad Hoc Wir Contention base d protocols with S	Charao (Ts) a or net ( <b>reless</b> ) ed pro Sched	cteristic and wir works, <i>Netwo</i> tocols, uling N	cs of the reless Desig <b>UNI</b> <b>rks</b> : I Conte	he Wireless sensor netw n Challenge <u><b>F– II</b></u> ssues in des ention basec nisms, Multi	Channel. Yorks (WSNs): es in Ad hoc and signing a MAC d protocols with a channel MAC	concepts and d Sensor Netwo Protocol, Clas h Reservation I -IEEE 802.11.	architectures. orks. ssification of Mechanisms,	
				UN	IT– III				
<b>Routing Protoco</b> Transport Layer routing, Classific	ols and Transpor protocol for Ad cation of Transpo	<i>t Lay</i> l hoc rt Lay	<i>er in A</i> networ ver solu	<i>d Hoc</i> rks, pr rtions,	Wireless N coactive rou TCP over A	<i>letworks</i> : Issue ting, reactive r Ad hoc Wireless	s in designing a outing (on-den s Networks.	a routing and hand), hybrid	
				UN	IT– IV				
Wireless Sensor components of a aggregation stra MAC- IEEE 802	Networks (WSN sensor node, WS tegies, MAC lay 2.15.4.	<i>s) an</i> SN Ne er pro	d MAC etwork otocols	C <b>Prot</b> e archit self-	<i>ocols:</i> Singl ecture: typic organizing,	e node architec cal network arc Hybrid TDMA	ture: hardware hitectures, data A/FDMA and (	and software relaying and CSMA based	
				UN	IT-V				
WSN Routing, I Network Localiz Design, Synchro	<i>Localization &amp; Qu</i> ation, absolute an nization, Transpo	oS: Is id rela ort Lay	sues in tive lo yer issu	WSN calizat es.	routing, Ol ion, triangu	LSR, Localizati lation, QOS in V	on: Indoor and WSN, Energy E	Sensor fficient	

1. C. Siva Ram Murthy and B. S. Manoj, *Ad Hoc Wireless Networks: Architectures and Protocols*, Prentice Hall Professional Technical Reference, 2008.

#### **Reference Books:**

- 3. Carlos De Morais Cordeiro and Dharma Prakash Agrawal, Ad Hoc & Sensor Networks: Theory and Applications, World Scientific Publishing Company, 2006.
- 4. Jagnnathan Sarangapani, *Wireless Ad Hoc and Sensor Networks-Protocols, Performance and Control*, CRC press, Taylor & Francis group, 2007.

#### Web References:

- 3. http://cse.iitkgp.ac.in/~smisra/course/wasn.html
- 4. https://www.youtube.com/playlist?list=PLJ5C\_6qdAvBHroAfekCO7K4xphEF74UPc

#### **Question Paper Pattern:**

#### Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

#### End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# Parallel and Distributed Algorithms (PDA)

VII Semester:	<b>B.Tech-CSE</b>					Sch	eme: 2017			
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Maximum Marks				
CS408	Professional Elective	L	T	P	<b>C</b>	Continuous Internal Assessment	End Exam	TOTAL		
Sessional Exam Duration: 2 Hrs End Exam Duration: 3 Hrs										
<b>Course Outcomes:</b> At the end of the course students will be able to										
<b>CO1:</b> Understand the types of parallel computers and demand for computational speed.										
CO2: Summa	arize the message	e passi	ing tecl	hnique	s and partiti	oning techniqu	es.			
CO3: Unders	stand the pipelini	ng tec	hnique	s usin	g pipeline pi	rograms.				
CO4: Interpre	et the synchronous	scom	outation	s and o	listributed te	rmination detect	ion algorithms.			
CO5: Unders	stand the distribut	ted sh	ared m	emory	systems an	d programming	g techniques.			
				UN	IT–I					
Basic Techniques         The Demand for Computational Speed, Potential for Increased Computational Speed, Types of Parallel computers, Cluster Computing         UNIT– II         Message Passing Technique         Basics of Message-Passing Programming, Using a Cluster of Computers, Evaluating Parallel Programs, Debugging and Evaluating Parallel Programs Empirically, Partitioning, Partitioning and Divide-and-Conguer examples										
				UN	T– III					
Pipelined Computations         Pipeline Techniques, computing platform, pipeline programs examples-solving a system of linear         Equations, Sorting numbers, prime number generation.										
Synchronous C	omputations				`					
Synchronization, Synchronized Computation, Synchronous Iteration Program Examples ,Partially Synchronous Methods <i>Load Balancing and Termination Detection</i> Load Balancing, Dynamic Load Balancing, Distributed Termination Detection Algorithms										
	UNIT– V									
<b>Distributed</b> share Achieving const sorting algorithm	<i>red memory syste</i> ant memory in a ns.	ems al DSM	<i>nd prog</i> system	g <b>ramm</b> n, distr	<i>ing</i> ibuted share	ed memory prog	gramming prim	itives,		

- 1. Parallel Programming, Barry Wilkinson, Michael Allen, Pearson Education, 2nd Edition
- 2. Parallel and Distributed Systems, Arun Kulkarni, Nupur Prasad Giri, Nikhilesh Joshi Bhushan Jadhav, Wiley Publications, 2<sup>nd</sup> Edition.

#### **Reference Books :**

- 1. Introduction to Parallel algorithms, Jaja, Pearson, 1992.
- 2. Introduction to Parallel Algorithms, C.Xavier and S.S. Iyengar, Wiley Series.

#### Web References:

1. https://www.tutorialspoint.com/parallel\_algorithm/parallel\_algorithm\_introduction.htm

## **Question Paper Pattern:**

# Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. QuestionNo1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## **End Exam**

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.
## **CLOUD COMPUTING (CC)**

VII Semester:	: CSE						Scl	neme: 2017		
<b>Course Code</b>	Category	Hou	ırs/We	ek	Credits	Ma	Maximum Marks			
CS409	Professional Elective	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional E	xam Duration:2	2 Hrs				End E	xam Duration	: 3 Hrs		
Carrier Orat	A ( (1	1.64	1		1 (11 1	1. 1				
Course Out	rstand the layers	and ty	ne cou	$\frac{1}{2}$ cloud		be able to				
CO1: Under	rstand the Virtua	1 Mac	hine P	rovisio	oning and N	ligration Servic	es in cloud			
CO3: Understand the Aneka Cloud Architecture and Hybrid Cloud Architecture.										
CO4: Analy and H	yse the Cloud Co 3M.	mputi	ng Ser	vices	provided by	Google, Amazo	on, Microsoft, S	ales force		
CO5: Understand the Cloud Applications, Best Practices and Future of Cloud.										
				TT						
Introduction to a Cloud, Cloud Providers, Cha	o Cloud Comput d Infrastructure I Illenges and Opp	t <b>ing:</b> H Manag ortuni	Roots o gement ities.	of Clou , Infra	id Computin structure as	ng, Layers and 7 s a Service Prov	Fypes of Cloud viders, Platform	s, Features of as a Service		
				UN	IT–II					
<i>Virtual Machi</i> (VM), VM Pr Context, and F	ine Provisioning ovisioning and I future Research I	<i>and</i> Manag Directi	<i>Migra</i> i geabili ions.	tion Se ty, VN	e <b>rvices:</b> Intr A Migration	roduction and In n Services, VM	nspiration, Virt I Provisioning	ual Machines in the Cloud		
				UN	IT– III					
Aneka-Integra	ation of Private a	ind Pi	ublic C	Clouds	: Introducti	on, Aneka Clou	d Architecture,			
Aneka Resour	ce Provisioning S	Servic	e, Ane	ka Hy	brid Cloud	Architecture and	d Implementatio	on steps.		
				UN	IT– IV					
Cloud computi	ing with Titans:	Goog	le: Goo	ogle A	pp Engine,	Google Web To	oolKit.			
Microsoft: Azu	re services plat	form,	windo	ws liv	ve, Exchang	ge online, shar	epoint services	,		
Microsoft Dyna Amazon SQS, movements to c	umic CRM. Ama Amazon Book s cloud, security	zon: A store,	Amazo Salesi	n EC2 force.c	, Amazon si com: force.c	impleDB, Amaz com, CRM, Ap	zon S3,Amazon p Exchange, II	front cloud 3M: services		

# UNIT-V

*Cloud Applications, Best Practices and Future of Cloud:* GrepTheWeb on Amazon cloud, ECG. Analyze your service, Best Practices, How cloud computing might Evolve in Future.

- 1. "Cloud Computing: Principles and Paradigms" by Rajkumar Buyya, James Broberg, and Andrzej Goscinski, Wiley Press, New York, USA, 2011.
- 2. "Cloud Computing: A Practical Approach" by Anthony T.Velte, Toby J Velte, Robert Elsenpeter. McGraw-Hill, Inc. New York, NY, USA, 2010

## **Reference Books :**

- "Architecting the Cloud: Design Decisions for Cloud Computing Service Models" by Michael J. Kavis, Wiley Press, 2014
- 2. "Enterprise Cloud Computing Technology Architecture Applications" by Gautam Shroff, Cambridge University Press, 2010.
- 3. "Cloud Computing Strategies" by Dimitris N. Chorafas, CRC Press ,2010.

## **Question Paper Pattern:**

## Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

# **COMPUTER VISION (CV)**

VII Semester: B.Tech-CSE							Sc	cheme: 2017	
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
CS410Professional ElectiveLTPCContinuous Internal AssessmentEnd Exan 60								TOTAL	
Socional Ex	om Duration.?	J Ura	0	0	5	40 End F	00 vom Durotion	100 2 Urs	
Sessional Lx	am Duration.2	1115						5 1115	
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to			
CO1: Understand modelling of image formation.									
CO2: Understand image feature detection and mapping.									
CO3: Understand segmentation by clustering									
CO4: Understand geometric methods.									
CO5: Understand probabilistic and inferential methods									
				U	NIT– I				
IMAGE FORM Calibration - Rad	ATION AND I diometry - Measu	MAG Iring I	E MC Light –	DELS Shad	S - Geome ows and sha	etric Camera N ading.	Iodels - Geon	netric Camera	
				UN	II – TI				
MULTIPLE IM	AGES - The Ge	ometr	y of N	Iultipl	e Views -	Stereopsis - Af	fine Structure f	from Motion -	
Projective Struct	ture from Motion	•		-		-			
				T	NIT_III				
Segmentation by	Clustering - Seg	ments	tion h	v Fittir	ng a Model	- Segmentation	and Fitting usin	g Probabilistic	
Methods - Track	ing with Linear I	Dynan	nic Mo	dels.	ig a wooder	- Segmentation	and I fitting usin	griobaomstic	
				U	NIT– IV				
GEOMETRIC N	AETHODS -Mod	lel-Ba	ised Vi	sion -	Smooth S	urfaces and thei	r Outlines - As	spect Graphs -	
Range Data.									
				U	NIT-V				
PROBABILIST	IC AND INFER	ENTL	AL ME	THO	DS - Recog	nition by Relati	ons between Te	emplates -	
Geometric Tem	plates from Spati	al Rel	ations	– App	lication – I	mage Based Rei	ndering.	•	

- 11. Forsyth D A and Ponce J Computer Vision: A Modern Approach Prentice Hall 2003
- 12. Horn B K P Robot Vision Cambridge MIT press 1986

## **Reference Books :**

- 1. Y Shirai Three-Dimensional Computer Vision Springer Verlag 1987
- 2. Wechsler Computational Vision Academic Press 1987
- 3. Haralick R M and Shapiro L G Computer and Robot Vision Vo I and II Addison Wesley 1993
- 4. Jain R C Kasturi R Machine Vision McGrawHill 1995

## Web References:

- 1. http://kercd.free.fr/linksKCD.html
  - 2. https://www.cs.ubc.ca/~lowe/vision.html
  - 3. http://www.visionscience.com/

## **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

## INTRODUCTION TO BLOCK CHAIN TECHNOLOGY (BCT)

VIII Semester:	<b>B.Tech-CSE</b>				Scheme: 2017					
<b>Course Code</b>	Category	Hours/Week			Credits	Ma	Maximum Marks			
CS418	CS418 Professional Elective	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2		End Exam Duration:3 Hrs							
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to				

**CO1:** Familiarise the concepts of blockchain and cryptocurrency paradigms.

**CO2:** Understand blockchain ecosystem and development platforms.

**CO3:** Understand fundamental economic principles of blockchain technology.

**CO4:** Understand applications of blockchain technology.

**CO5:** Identify challenges in blockchain technology.

#### UNIT-I

Currency: Technology Stack, The Double-Spend and Byzantine Generals' Computing Problems, How a Crypto currency Works, Summary.

#### UNIT-II

Contracts: Financial Services, Crowd funding, Bitcoin Prediction Markets, Smart Property, Smart Contracts, Blockchain 2.0 Protocol Projects, Wallet Development Projects, Blockchain Development Platforms and APIs, Blockchain Ecosystem, Ethereum, Dapps, DAOs, DACs, and DASs, Automatic Markets and Tradenets, The Blockchain as a Path to Artificial Intelligence.

#### UNIT-III

Extensibility of Blockchain Technology Concepts, Fundamental Economic Principles, Distributed Censorship-Resistant Organizational Models, Digital Identity Verification, Digital Art, Blockchain Government.

## UNIT-IV

Efficiency and Coordination Applications Beyond Currency, Economics, and Markets, Blockchain Science, Blockchain Genomics, Blockchain Health, Blockchain Learning, Blockchain Academic Publishing

#### UNIT-V

Advanced Concepts: Terminology and Concepts, Currency, Token, Tokenizing, Currency, Currency Multiplicity, Demurrage Currencies. Limitations: Technical Challenges, Business Model Challenges, Scandals and Public Perception, Government Regulation, Privacy Challenges for Personal Records, Overall: Decentralization Trends Likely to Persist.

1.Swan, Melanie. Blockchain: Blueprint for a new economy. "O'Reilly Media, Inc.", 2015.

## **Reference Books :**

1.Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Narayanan, et. al. Princeton, 2016. ISBN: 978

2.Mastering Bitcoin: Programming the Open Blockchain, 2nd ed., Antonopoulos, O'Reilly, 2017. ISBN: 978

## Web References:

1. https://redis.io/

2. https://www.javatpoint.com/nosql-databases

3. https://www.oracle.com/database/technologies/related/nosql.html

## **Question Paper Pattern:**

## Sessional Exam

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## WIRELESS NETWORKS (WN)

VIII Semester:	<b>B.Tech-CSE</b>				<b>Scheme: 2017</b>				
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
CS419	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL	
	Elective	3	0	0	3	40	60	100	
Sessional Ex	am Duration:2 l	Hrs				End E	xam Duration:	3 Hrs	
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to			
CO1: Unders	stand the design a	nd pe	rforma	nce is	sues of Cellu	ilar & Ad hoc	wireless networl	<u>(S.</u>	
CO2: Demoi	istrate the Mediu	m Aco	cess Co	ontrol	(MAC) laye	r protocols with	h scheduling me	chanisms.	
CO3: Compare the Table driven, On Demand Ad hoc routing protocols.									
Networks	anze the transpor	tlaye	i desig	n goai	s, network s	eculity issues c	of Au Hoc wire	less	
CO5: Apply	the Quality of Se	rvice	framev	vorks	in Ad Hoc V	Vireless Netwo	rks		
UNIT– I									
<i>Introduction:</i> Computer Networks, Computer Network Software, Computer Network Architecture. <i>Ad Hoc Wireless Networks:</i> Introduction, Cellular and Ad Hoc Wireless Networks, Applications of Ad Hoc Wireless Networks, Issues in Ad Hoc Wireless Networks, Ad Hoc Wireless Internet									
MAC Protocols Introduction, Is MAC protocol Protocols, Cont	for Ad Hoc Wire sues in Designin for Ad Hoc Wir ention – Based M	e <i>less I</i> g a M eless IAC P	N <i>etwor</i> IAC pr Netwo Protoco	rks: cotocol orks, C ls with	for Ad Ho Classification	c Wireless Net ns of MAC pro g Mechanisms	works, Design otocols, Conten	Goals of a tion-Based	
				UNI	1-111				
<b>Routing Protoco</b> Introduction, Iss Routing Protoco	ols for Ad Hoc W sues in Designing ols, Table- Driver	7 <i>ireles</i> g a Ro n Rout	ss Networting I ting Pro	v <b>orks:</b> Protoc otocol	ol for Ad H s, On-Dema	oc Wireless No nd Routing Pro	etworks, Classif tocols	ïcations of	
				UNI	T– IV				
Transport Layer in Ad Hoc Wireless Networks: Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP over Ad Hoc Wireless Networks, Other Transport Layer Protocols for Ad Hoc Wireless Networks, Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks									
<i>Quality of Serv</i> Introduction, Is QoS Solutions,	<i>ice in Ad Hoc Wi</i> sues and Challen QoS Frameworks	<b>ireless</b> ges in s for A	s <i>Netwo</i> 1 provie Ad Hoc	orks: ding Q	QoS in Ad H less Networl	oc Wireless No	etworks, Classif	ications of	

1. Ad Hoc Wireless Networks: Architectures and Protocols- C. Siva Ram Murthy and B.S.Manoj, Pearson Education, Inc 2014.

2. Ad Hoc Mobile Wireless Networks – Subir Kumar Sarkar, T G Basvaraju, C Puttamadappa, Auerbach Publications, 2012

## **Reference Books :**

- 1. Wireless Ad- hoc and Sensor Networks: Protocols, Performance and Control –Jagannathan Sarangapani, CRC Press.
- 2. C D M Cordeiro, D. P. Agarwal, Adhoc and Sensor Networks: Theory and applications, World Scientific, 2006.
- 3. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, 2003.
- 4. Wireless Sensor Networks C. S. Raghavendra, Krishna M. Sivalingam, 2004, Springer.

## Web References:

https://nptel.ac.in/courses/106105160/

## **Question Paper Pattern:**

## Sessional Exam

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## **End Exam**

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## Note:

- 1. Network Simulator 2 (NS2) can be used to analyze the MAC and Routing protocols for Ad hoc Routing Protocols in Unit-II & III.
- 2. Scope for Apply type of questions for Assignments from Units- II & IV.

## **REAL TIME SYSTEMS (RTS)**

VIII Semester:	B.Tech-CSE				Scheme: 2017				
Course Code	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks		
CS420	Professional Elective	L 3	T	P	C 3	Continuous Internal Assessment 40	End Exam	TOTAL	
Sessional Exa	m Duration:2 Hi	rs	U	U	5	End E	xam Duration	3 Hrs	
Course Outcor CO1: Understa	<b>nes:</b> At the end of and the basic cond	f the c cepts (	course of real	studen time c	ts will be at omputing.	ble to			
CO2: Understa	and various types	of Ta	sk Sch	edulin	g algorithm	s.			
CO3: Understa	and Real-time pro	gram	ming e	nviron	ments.				
CO4: Understa	and Real time cor	nmun	ication	proto	cols.				
CO5: Compare	e traditional and r	eal tir	ne data	abases	•				
				TINIT	гт				
Introduction to Re Concepts, Example Systems and Tasks Task assignment Classical Uniproce Assignment, Fault	al time computing e of real-time app s- Performance m and Scheduling essor Scheduling tolerant scheduling	ng easure Algon ng, RT	cithms, RT	ructure real tin UNII Unipr CP UNII	e of a real time ne systems, T T-II Pocessor Sch	me system, Cha Estimating Pro eduling of IRIS	aracterizing Rea gram Run Time S Tasks, Task	l Time s.	
<b>Programming Lan</b> Desired Language decomposition, Ru Languages, Progra	nguages and Tool Characteristics, I n time error hand mming Environn	<i>ls</i> Data T lling, ' nents,	`yping, Task S Run ti	Contr chedul me Su	ol Structure ling, Timing pport.	s, Facilitating h g Specifications	nierarchical 5, Some Experin	nental	
	• •			UNIT	-IV				
Real Time Commu Network topologie deadline based pro	anication s, Network archit tocol, Fault tolera	tecture ant rou	e issue uting.	s, Prot	ocols- conte	ention based, to	ken based, polle	ed bus,	
				UNI	Γ– V				
<b>Real time Databas</b> Transaction priorit approach to impro-	<i>es</i> ies and aborts, Co ve predictability,	oncurr Datab	rency coases for	control	issues, Disl Real time s	s scheduling alg	gorithms, Two J	phase	

- 1. C.M. Krishna, Kang G. Shin "Real Time Systems", International Edition, McGraw Hill Companies, Inc., New York, 1997
- 2. Philip A. Laplante and Seppo J. Ovaska, "Real-Time Systems Design and Analysis: Tools for the Practitioner" IV Edition IEEE Press, Wiley. 2011

#### **Reference Books :**

- 1. Jane W.S. Liu, Real-Time Systems, Pearson Education India, 2000.
- 2. Rajib Mall, "Real Time System: Theory and Practice." Pearson, 2008

## **Question Paper Pattern:**

#### Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## **End Exam**

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## **DEEP LEARNING( DLE)**

			DEEF		MINING( DI	LE)					
VIII Semester	: B.Tech-CSE				Scheme: 2017						
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks				
CS421	Professional Elective	L 3	<b>T</b>	<b>P</b>	<b>C</b>	Continuous InternalEnd ExamTOTAL TOTALAssessment4060100					
Sessional Ex	am Duration:2 ]	Hrs	0	Ű		End E	xam Duration	:3 Hrs			
Course Outco CO1: Unders Regress CO2: Summa CO3: Unders CO4: Unders CO5: Unders <i>CO5</i> : Unders <i>Introduction to I</i> <i>Up and Running</i> Installation, Crea Value, Linear Re Algorithm, Savir Name Scopes, M	omes: At the end stand the historica asion, Gradient De arize the fundame stand the training stand the training stand the Recurre Deep Learning : g with Tensor Flo ating Your First G egression with Ten and Restoring I Iodularity, Sharin	of the al trem escent entals of De itiona nt Ne Introd w araph a nsorF Mode g Var	e cours ads in c c, optim of Art cep Ne l Neur ural Neur ural Neur luction and Ru low. Ir ls, Vis iables.	e stud leep le nizers, ificial ural N al Net etwork t, Histo nplem ualizir	ents will be earning and u graph visua Neural Netv ets. works Archi as and deep 1 IT- I prical trends It in a Sessio enting Gradi ag the Graph	able to use Tensor flow lization and tra works. itecture. RNN training. in Deep Learni on, Managing G ient Descent, Fe and Training C	y for performing ining curves. ng raphs, Lifecycl eeding Data to t curves Using Te	g Linear e of a Node he Training ensorBoard,			
				UNI	T– II						
UNIT– II Introduction to Artificial Neural Networks From Biological to Artificial Neurons, Training an MLP with TensorFlow's High-Level API, Training a DNN Using Plain TensorFlow, Fine-Tuning Neural Network Hyperparameters UNIT– III Training Deep Neural Nets Vanishing/Exploding Gradients Problems, Reusing Pretrained Layers, Faster Optimizers, Avoiding Overfitting Through Regularization											
				UNI	T– IV						
<i>Convolutional N</i> The Architecture 5, AlexNet, Goo	<i>eural Networks</i> of the Visual Co gLeNet, ResNet.	ortex,	Convo	lution	al Layer, Po	oling Layer., C	NN Architectu	res : LeNet-			

UNIT– V

# Recurrent Neural Networks

Recurrent Neurons, Basic RNNs in TensorFlow, Training RNNs, Deep RNNs

- 1. "Deep Learning" Ian Goodfellow Yoshua Bengio Aaron Courville, MIT Press book.
- 2. "Hands-On Machine Learning with Scikit-Learn and TensorFlow" March 2017: First Edition **Reference Books :**

- 1. "Neural Networks and Deep Learning", Michael Nielsen.
- 2. "Neural Networks and Deep Learning" Aggarwal, Charu C.Springer International Publishing. Web References:
  - 1. https://www.coursera.org/specializations/deep-learning?
  - 2. https://www.coursera.org/learn/introduction-tensorflow?

## **Ouestion Paper Pattern:**

## **Sessional Exam:**

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## **End Exam:**

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## **DIGITAL FORENSICS (DF)**

VIII Semester:	B.Tech-CSE				Scheme: 2017						
<b>Course Code</b>	Category	Hours/Week			Credits	Maximum Marks					
CS422	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL			
	Elective	3	0	0	3	40	60	100			
Sessional Ex	am Duration:2	Hrs				End Exam Duration:3 Hrs					
Course Outco	omes: At the end	of the	e cours	e stud	ents will be	able to					
CO1: Unders	stand the fundame	ental o	concep	ts of c	omputer for	ensics.					
CO2: Unders	stand the rules, tp	es an	d proce	edure o	of evidence	collection.					
CO3: Analyz	ze to validate the	comp	uter for	rensic	s data.						
CO4: Summa	arize the tools ne	eded t	for con	nputer	forensics.						
				-							

**CO5:** Understand file systems of Microsoft Windows and DOS systems.

## UNIT-I

*Computer Forensics Fundamentals:* What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement, Computer Forensics Evidence and Capture: Data Recovery Defined, Data Back-up and Recovery, The Role of Back-up in Data Recovery, The Data-Recovery Solution.

## UNIT-II

*Evidence Collection and Data Seizure:* Why Collect Evidence? Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collection, Artifacts, Collection Steps, Controlling Contamination: The Chain of Custody Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene, Computer Evidence Processing Steps, Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication, Practical Consideration, Practical Implementation.

#### UNIT-III

*Computer Forensics analysis and validation:* Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project. Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

#### UNIT-IV

*Current Computer Forensic tools:* Evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools. Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

## UNIT-V

*Working with Windows and DOS Systems*: Understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

- 1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
- 2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

## **Reference Books:**

- 1. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning
- 2. Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.

## Web References:

- 1. https://www.cs.nmt.edu/~df/lectures.html
- 2. https://www.youtube.com/playlist?list=PLGB2uErtks4pTmi7iy9ean8TR2utFvqrg

## **Question Paper Pattern:**

## Sessional Exam:

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# HIGH PERFORMANCE COMPUTING (HPC)

VIII Semester:	<b>B.Tech-CSE</b>						Sch	eme: 2017		
<b>Course Code</b>	Category	Ηοι	ırs/We	ek	Credits	Ma	ximum Marks			
CS423	Professional Elective	L	Т	P	С	Continuous Internal Assessment	End Exam	TOTAL		
		3	0	0	3	40	60	100		
Sessional Ex	am Duration:2	Hrs				End E	xam Duration:	3 Hrs		
Course Oute	omes. At the end	ofth	e cours	h etud	ents will be	able to				
CO1: Under system	stand the limitations.	ons, c	ontrol	structu	re and com	munication mo	dels of parallel	computer		
CO2: Summ	CO2: Summarize the decomposition techniques and mapping techniques for parallel algorithms.									
<b>CO3:</b> Understand One-to-all, all-to-one and all-to-all communication operations for parallel computers.										
CO4: Interpr	et the programmin	ng tech	niques	using	message pass	sing paradigm.	<b>*</b>	<b>`</b>		
CO5: Under	stand the thread p	orogra	mming	g for sh	ared addres	s space platform	ns using OpenN	ΛP.		
UNIT-1   Introduction   Implicit parallelism, limitations of memory system performance, control structure of parallel platforms, communication model of parallel platforms, message passing costs in parallel computers, routing mechanisms for interconnection networks.   UNIT-II   Parallel algorithm design   Decomposition techniques, tasks and interactions, mapping techniques for load balancing, methods for reducing interaction overheads, parallel algorithm models- the data parallel model, the task graph model, the work pool model, the master-slave model, the pipeline model, hybrid models.										
<b>Basic commun</b> One-to-All Bro Improving the s communication	<i>ication operation</i> adcast and All-to speed of some co	es o-One ommu	e Redue nicatio	ction, n oper	All-to-all B ations: split	roadcast and re ting and routin	eduction, scatter g messages in p	r and gather, parts, all port		
				UN	IT– IV					
<b>Programming using message passing paradigm</b> Principles of message passing programming, The building blocks, MPI: The message passing interface, topologies and embedding, overlapping communication with computation: non blocking communication operations.										
				UN	IT-V					
<b>Programming</b> S Threads, POSIX programming n multiple for dire	shared address sp K threads, synchro nodel, specifying ectives, merging o	pace j oniza concu direct	<i>platfor</i> tion pri urrent t ives, ne	<i>ms</i> mitive asks: a esting	es, attributes assigning ite parallel dire	of threads and rations to threa ectives.	mutex, OpenM ds, synchroniza	P – The tion across		

- 3. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, Introduction to Parallel Computing, Second Edition, Pearson Education, 2007.
- 4. Benedict R Gaster, Lee Howes, David R Kaeli Perhaad Mistry Dana Schaa, Heterogeneous Computing with OpenCL, McGraw-Hill, Inc. Newyork, 2011.

## **Reference Books :**

- 3. Michael J. Quinn, Parallel Programming in C with MPI and OpenMP, McGraw-Hill International Editions, Computer Science Series, 2004.
- 4. Jason Sanders, Edward Kandrot, CUDA by Example An Introduction to General-Purpose *GPU* Programming, Addison Wesley, 2011.

#### Web References:

- 1. https://www.tutorialspoint.com/parallel\_algorithm/parallel\_algorithm\_introduction.html
- 2. https://computing.llnl.gov/tutorials/openMP
- 3. https://nptel.ac.in/courses/106108055

## **Question Paper Pattern:**

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## IMAGE AND VIDEO PROCESSING (IVP)

VIII Semester: B.	Tech- CSE				Scheme: 2017					
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	Aaximum Marks			
CS424	Professional	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
	Elective	3	0	0	3 40 60 10					
Sessional Exar	m Duration:2 H	ſS				End E	xam Duration:	3 Hrs		
Course Outcon	nes: At the end of	f the c	ourse s	studen	ts will be ab	ole to				
<b>CO1:</b> Understand the relationships between pixels in digital images and perform various linear and										
<b>CO2:</b> Apply various image enhancement techniques both in spatial and frequency domain.										
CO3: Understa	CO3: Understand image compression models and different types of compression techniques.									
CO4: Perform Image segmentation on real time images.										
<b>CO5:</b> Understand the principles of Video imaging and Video display.										
	<u> </u>			UNIT	– I					
<b>Digital Image Fu</b> of Image Processi Quantization - So Interpolation - Lin	<b>Indamentals:</b> Denng System - Hun Dome Basic Relationear And Non Lin	efinitio nan Vi onshij near O	on and isual Sy ps bety peratio	Appli ystem ween 1 ons.	cations of D - Image Sen Pixels, Spat	Digital Image Pr Ising Acquisitic ial and Gray L	cocessing – Cor on - Image Samj Level Resolution	nponents pling and n, Image		
				UNIT	Г <b>— II</b>					
Image Enhancen Image Sharpening Frequency Domai	nent and Restor g – Image Resto in Filtering.	<b>ration</b> pration	: Histo 1 – De	gram gradat	Modificatio ion Model	n Techniques - – Noise Mode	– Image Smoot els – Spatial Fi	hening – ltering –		
				UNIT	– III					
<b>Image Compress</b> Compression Mode plane Coding, Los Transform coding	sion: File format els: Error Free Co ssless Predictive ( - Digital Waterm	t (bmj ompre Coding narking	p, tiff, ssion: g; Loss g	pcx, Huffm sy Con	gif, jpeg.) an Coding, npression: L	- Compression Arithmetic Coo ossy Predictive	fundamentals ling, LZW codi c Coding, Block	– Image ng, Bit		

#### UNIT-IV

**Image Segmentation:** Point, Line and Edge Detection - Thresholding – Region Based Segmentation – Segmentation Using Morphological Watersheds - The Use of Motion in Segmentation

#### UNIT-V

**Introduction to Video Processing:** Video Capture and Display- Principles of Color Video Imaging, Video Cameras, Video Display, Composite versus Component Video; Analog Video Raster-Progressive and Interlaced Scan, Characterization of a Video Raster; Analog Color Television Systems; Digital Video.

- Rafael Gonzalez & Richard Woods, Digital Image Processing, 3rd Edition. Pearson publications, 2012
- 2. Anil K. Jain, Fundamental of Digital Image Processing, PHI publication, 2013.
- 3. Video Processing and Communications- Yao Wang, Jorn Ostermann, Ya-Qin Zhang

## **Reference Books :**

- 1. Pratt, Digital Image Processing, 4th Edition, Wiley Publication, 2007.
- 2. S. Jayaraman, S. Esakkirajan & T. Veera Kumar, Digital Image Processing, Mc. Graw Hill, 2011.
- 3. S. Sridhar, Digital Image Processing, Oxford University Press, 2011.

## Web References:

https://en.wikipedia.org/wiki/Digital\_image\_processing

https://reference.wolfram.com/language/guide/ImageProcessing.html

## **Question Paper Pattern:**

## Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No.1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

## End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions i.e there will be two questions from each unit and the student should answer any one question.

## **EMBEDDED SYSTEMS (EBS)**

VIII Semester:	VIII Semester: B.Tech-CSE					Scheme: 2017				
<b>Course Code</b>	Category	Hou	rs/We	ek	Credits	Ma	ximum Marks			
CS425	Professional Elective	L	Т	Р	С	Continuous Internal Assessment	End Exam	TOTAL		
<b>a i i b</b>		3	0	0	3	40	60	100		
Sessional Exam Duration:2 Hrs End Exam Duration:3 Hrs										
Course Outcomes: At the end of the course students will be able to   CO1: Provides general overview of Embedded Systems   CO2: Show current statistics of embedded systems.   CO3: Design, Code, Compile, and test real time software.   CO4: Understand the RTOS Environment   CO5: Integrate a fully functional system including hardware and software.										
UNIT– I										
Introduction to en hardware units and	<b>nbedded System</b> l device in a syste	is: En em, Ei	nbedde mbedd	d syste ed soft	ems, process tware in a sy	sor embedded in ystem, Example	nto a system, E	mbedded systems,		

Design process in embedded system, formalization of system design, Design process and design examples, Classification of embedded systems, skills required for an embedded system designer.

## UNIT-II

**Devices and communication buses for devices network:** IO types and example, Serial communication devices, Parallel device ports, Sophisticated interfacing features in device ports, wireless devices, timer and counting devices, Watch dog timer, Real time clock, networked embedded systems, Serial bus communication protocols, parallel bus device protocols – parallel communication internet using ISA, PCI, PCI-X and advanced buses, internet enabled systems – network protocols, wireless and mobile system protocols.

## UNIT-III

**Device drivers and interrupts and service mechanisms:** Programming – I/O busy-wait approach without interrupt Service mechanism, ISR concept, interrupt sources, interrupt servicing (handling) Mechanism, multiple interrupts, context and periods for context switching, interrupt latency and deadline, classification of processors interrupt service mechanisms from context-saving angle, Direct memory access, device driver programming

#### UNIT-IV

**Inter Process communication and synchronisation of processes, Threads and tasks:** Multiple process application, multiple threads in an application, Tasks, Task states, Task and Data, Clear-cut distinction between functions. ISRS and tasks by their characteristics, concept and semaphores, shared data, Interprocess communication, Signal function, Semaphore functions, Message Queue functions, Mailbox functions, Pipe functions, Socket functions, RPC functions.

#### UNIT-V

**Real – time Operating Systems:** OS Services, process management, Timer functions, Event functions, Memory management, Device, file and IO subsystems management, Interrupt routines in RTOS environment and handling of interrupt source calls. Real-time Operating systems, Basic Design using RTOS, RTOS task scheduling models, interrupt latency and response of the tasks as performance metrics, OS Security issues, Introduction to embedded software development process and tools, Host and target machines, linking and location software

2. Raj Kamal [2017], [3<sup>rd</sup> Edition], Embedded Systems – Architecutre, Programming and Design, McGraw-Hill.

## **Reference Books :**

- 1. Arnold S Burger, Embedded System Design An Introduction to Processes, Tools and Techniques, 1st Edition, CMP Books, 2007.
- 2. David.E. Simon, An Embedded Software Primer, 2nd Edition, Pearson Edition, 2009.
- 3. Jonathan W Valvano, Embedded Micro Computer Systems, Real Time Interfacing,1st Edition, Books / Cole,Thomson learning 2006.

## Web References:

1. https://nptel.ac.in/courses

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## **End Exam**

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