Computer Dept.

Bachelor Of Engineering

Question Papers Nov-Dec 2019

Sem–III to VIII

SE (CM) (III) (Choice Based) 14/11/19

Total Marks:80

Duration: 3Hrs

NB 1. Question No.I is compulsory.
2. Attempt any **three** from the remaining six questions.
3. Figures to the right indicate full marks.

Q1a. If $L\{tsin\omega t\} = \frac{2\omega s}{(s^2+\omega^2)^2}$, find $L\{\omega tcos\omega t + sin\omega t\}$ [20]

b. If $f(z) = (x^2 + axy + by^2) + i(cx^2 + dxy + y^2)$ is analytic ,find a,b,c and d

c. **Find** the Fourier series expansion of $f(x) = x^3 \ \ (-\pi, \pi)$

d. If the two regression equations are $4x - 5y + 33 = 0, 20x - 9y - 107 = 0$ find i) the mean values of x and y

ii) the Correlation Coefficient iii) Standard deviation of y if variance of x is 9

Q2 a. Show that the function is Harmonic and find the Harmonic Conjugate
$u = cosx\ coshy - 2xy$ [6]

b. Evaluate $\int_0^\infty e^{-t}(\int_0^t u^2\ sinhu\ coshu\ du)dt$) using Laplace Transform. [6]

c. Find Fourier Series expansion of $f(x) = x \qquad -1 < x < 0$
$= x + 2 \qquad 0 < x < 1$ [8]

Q3 a. Find the Analytic function $f(z) = u + iv$ if $u - v = e^x(cosy - siny)$ [6]

b. Find Inverse Z transform of $\frac{5z}{(2z-1)(z-3)} \quad \frac{1}{2} < |z| < 3$ [6]

c. Solve the Differential Equation using Laplace transform
$(D^2 - 2D + 1)y = e^t$, $y(0) = 2$, y'(0)= -1 [8]

Q4 a. Find the Complex Form of Fourier Series for $f(x) = cosax \ \ (-\pi, \pi)$ [6]

b. Find the Spearman's Rank correlation coefficient between X and Y. [6]

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

c. Find the inverse Laplace transform of i)$\frac{s-1}{s^2+2s+2}$ ii)$\frac{e^{-\pi s}}{s^2(s^2+1)}$ [8]

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Q5 a. Find the $Z\{f(k)\}$ where $f(k) = 4^k, k < 0$ [6]
$= 3^k, \ k \geq 0$

b. Show that $\{cosx, cos2x, cos3x, \ldots\ldots\}$ is orthogonal set over the interval $[0,2\pi]$. Construct the corresponding orthonormal set. [6]

c. Find the bilinear transformation which maps the points $z = 1, i, -1$ into the points $w = i, 0, -i$, Hence find the image of $|z| < 1$. [8]

Q6 a. Fit a straight line to the given data [6]

X	10	12	15	23	20
Y	14	17	23	25	21

b. Find Inverse Laplace Transform using Convolution theorem $\frac{1}{(s-2)^3(s+3)}$ [6]

c. Find Half Range Cosine Series for $f(x) = sinx$ in $(0,\pi)$ and hence deduce that $\frac{\pi^2-8}{16} = \frac{1}{1^2.3^2} + \frac{1}{3^2.5^2} + \frac{1}{5^2.7^2} + \cdots\ldots\ldots$ [8]

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SE(III) (CBM) (Choice based) 18/11/19

Time: 3 Hours **Marks: 80**

N.B. : 1. Question One is Compulsory.
2. Solve any Three out of remaining.
3. Draw neat and clear diagrams.
4. Assume suitable data if required

Q1	a)	What are universal gates? Why are they called so? Explain with suitable example.	4M
	b)	Perform following subtractions using 7's complement method. a) $(20)_5 - (14)_5$ b) $(20)_{10} - (15)_{10}$	4M
	c)	Perform $(34)_{10} - (12)_{10}$ in BCD using 10's complement method	4M
	d)	Explain lockout condition. How can it be avoided	4M
	e)	If the 7 bit hamming code word received by receiver is 1011011, assuming the even parity, state whether the received code word is correct or wrong? If wrong locate the bit having error and extract corrected data.	4M
Q2	a)	Reduce using Quine McClusky Method & realize the operation using NOR gates only. $F(A,B,C,D) = \Sigma m(0,1,2,8,10,11,14,15)$	10M
	b)	Explain one digit BCD adder	10M
Q3	a)	Construct 32:1 MUX using 8:1 MUX only. Also comment about select lines used.	10M
	b)	Solve the following using K-Map $F(A,B,C,D) = \pi M(3,4,5,6,7,10,11,15)$	5M
	c)	Design full adder using half adders and few gates	5M
Q4	a)	Convert SR Flip flop to JK flip flop and T flip flop	10M
	b)	Design 3-bit asynchronous up-down counter	10M
Q5	a)	Design 4-bit Binary to Gray Code Convertor.	10M
	b)	What is race around condition? How it is overcome in Master Slave JK Flip Flop?	5M
	c)	Design 1-Bit Magnitude comparator using logic gates.	5M
Q6		Write a short note on any Four	20M
	a)	VHDL Modelling Styles	
	b)	TTL and CMOS Logic Families	
	c)	SISO and PISO Shift Registers	
	d)	ALU	
	e)	Twisted ring counter	

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20/11/19.

B.E. (II Sem) COMP - CBCS

(3 hrs) Max. Marks: 80

1) Question **no.1** is **compulsory**.
2) Solve any **three** questions out of remaining **five** questions.
3) All questions carry equal marks as indicated by figures to the right.
4) Assume appropriate data whenever required. State all assumptions clearly.

Q.1 a) Prove using Mathematical Induction (05M)

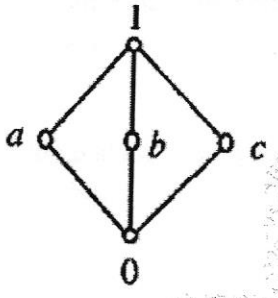
$1^2 + 2^2 + 3^2 + \ldots + n^2 = n(n+1)(2n+1)/6$

b) Let A = {a,b,c}. Draw Hasse Diagram for (p(A), ⊆) (05M)

c) Let A={1,2,3,4,5}. A relation R is defined on A as aRb iff a<b. Compute R^2 and R^∞ (05M)

d) Let f : R O R, where f(x) = 2x – 1 and $f^{-1}(x) = (x+1)/2$ (05M)
Find $(f \circ f^{-1})(x)$

Q.2 a) Define Distributive Lattice. Check if the following diagram is a Distributive lattice or not. (04M)



b) Prove that set G = {1,2,3,4,5,6} is a finite abelian group of order 6 with respect to multiplication module 7 (08 M)

c) Find the number of positive integers not exceeding 100 that are not divisible by 5 or 7. Also draw corresponding Venn Diagram. (08 M)

Q.3 a) Construct Truth Table and check if the following statement is tautology.

$(P \rightarrow Q) \leftrightarrow (\neg Q \rightarrow \neg P)$ (04 M)

b) Consider the (2,5) group encoding function defined by (08 M)
e(00)=00000 e(10)=10101
e(01)=01110 e(11)=11011
Decode the following words relative to a maximum likelihood decoding function.
i) 11110 ii) 10011 iii) 10100

c) How many four digits can be formed out of digits 1,2,3,5,7,8,9 if no digit is repeated twice? How many of these will be greater than 3000? (08 M)

Q.4 a) A bag contains 10 red marbles, 10 white marbles, and 10 blue marbles. What is the minimum no. of marbles you have to choose randomly from the bag to ensure that we get 4 marbles of same color? Use pigeonhole Principle. (04 M)

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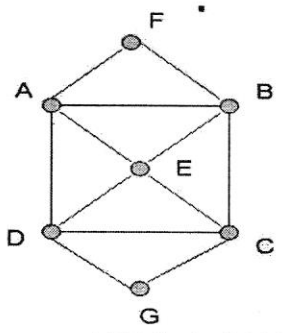
b) Define Euler Path, Euler Circuit, Hamiltonian Path and Hamiltonian Circuit. Determine if following diagram has Euler Path, Euler Circuit, Hamiltonian Path and Hamiltonian Circuit and state the path /circuit. (08 M)



c) In how many ways a committee of three faculty members and 2 students can be formed from 7 faculty members and 8 students. (08 M)

Q.5 a) Let Z_n denote the set of integers $\{0,1,2,...n-1\}$. Let $\odot$ be a binary operation on Z_n such that a $\odot$ b= reminder of ab divided by n (04M)

i) Construct table for the operation $\odot$ for n=4

ii) Show that $(Z_n, \odot)$ is a semi group for any n

b) Find Transitive Closure of R represented by M_R as follows using Warshall's algorithm set {a,b,c,d}. (08M)

$$M_R = \begin{vmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{vmatrix}$$

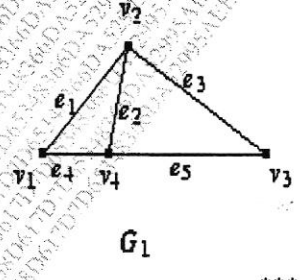
c) Let A = {1, 2, 3, 4, 5}, and let

R = {(1, 1),(1, 3),(1, 4),(2, 2),(2, 5),(3, 1),(3, 3),(3, 4),(4, 1),(4, 3),(4, 4),(5, 2),(5, 5)}. Check if R is a equivalence relation. Justify your answer. Find equivalence classes of A. (08M)

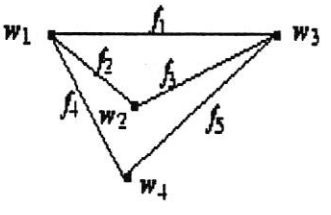
Q.6 a) How many vertices are necessary to construct a graph with exactly 6 edges in which each vertex is of degree 2. (04 M)

b) What is the solution of the recurrence relation $a_n = -a_{n-1} + 4a_{n-2} + 4a_{n-3}$ with $a_0=8$, $a_1=6$ and $a_2=26$? (08M)

c) Determine if following graphs G_1 and G_2 are isomorphic or not. (08M)



G_1



G_2

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22/11/19.

S.E/SEM III/COMP/ Choice Base

(3 Hours) [Total Marks : 80]

N.B. : 1. Question **One** is **Compulsory.**
2. Solve any **Three** out of remaining.
3. **Draw** neat and **clear** Diagrams.
4. Assume suitable **data** if required

Q.1. Attempt the following

A. Represent an AM signal both in time domain and frequency domain giving their mathematical equation for e_{AM}. 05

B. List the ideal and practical characteristics with their values for an op-amp. 05

C. What is DC load line? What is the importance of Q-point selection on a DC load line? 05

D. What are the differences between PAM, PWM and PPM? 05

Q.2.

A. Explain with neat diagram, the working of Hartley Oscillator using transistor. 10

B. Describe the working of class A and Class C power Amplifier in detail with relevant diagrams. 10

Q.3.

A. Explain the application of op-amp as differentiator. 10

B. Explain the need of biasing and stabilization. In a Silicon transistor circuit with a fixed bias, V_{CC}=9V, R_C=0.5KΩ, R_B=60KΩ, β=60, V_{BE}=0.7V. Find the operating point on DC load line. 10

Q.4.

A. What is the role of multiplexing in communication system? Explain TDM in detail. 10

B. Explain how Op-Amp can be used as inverting summer. 10

Q.5.

A. Derive the formula of total power in AM. An AM signal has a total power of 48 Watts with 45% modulation. Calculate the power in the carrier and the sidebands. 10

B. Draw Input and output characteristics of CE Configuration. 05

C. Explain Zero Crossing Detector using Op-amp 741. 05

Q.6.

A. Define measures of information. A source puts out one of five possible symbols once every millisecond. The probabilities of these symbols are 1/2, 1/4, 1/8, 1/16 and 1/16. Find information rate and Entropy. 10

B. Draw waveforms of natural and flat top sampling signal for a given sine wave signal 05

C. Draw block diagram of super-heterodyne receiver with waveforms for each block. 05

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Paper / Subject Code: 50905 / Data Structures

SE / Comp / choice based / Sem – III

26-11-2019

Duration: 3 hrs **Total Marks: 80**

N.B: (1) Question No. 1 is Compulsory
(2) Attempt any **three** questions of the remaining **five** questions
(3) **Figures** to the **right** indicate **full** marks
(4) Make suitable assumptions wherever necessary with proper justifications

1 (a) Define Data Structure. Differentiate linear and non-linear data structures with example. **(5)**
(b) Write a C function to implement Insertion sort. **(5)**
(c) What are different ways to represent graphs in memory? **(5)**
(d) What is expression tree? Derive an expression tree for (a+(b*c))/((d-e)*f) **(5)**

2 (a) What is Hashing? Hash the following data in a table of size 10 using linear probing and quadratic probing. Also find the number of collisions. **(10)**
63, 82, 94, 77, 53, 87, 23, 55, 10,44
(b) Write a recursive function to perform pre-order traversal of a binary tree. **(8)**
(c) Given an array int a[] = {23,55,63,89,45,67,85,99}. Calculate address of a[5] if base address is 5100. **(2)**

3 (a) Write a C program to convert infix expression to postfix expression. **(10)**
(b) Demonstrate step by step insertion of the following elements in an AVL tree. **(10)**
63, 9, 19,18,108,99,81,45

4 (a) Write a C program to implement circular linked list that performs following functions **(12)**
-Insert a node in the beginning
-Insert a node in the end
-Count the number of nodes
-Display the list
(b) Given the frequency for the following symbols, compute the Huffman code for each symbol. **(8)**

Symbol	A	B	C	D	E	F
Frequency	9	12	5	45	16	13

5 (a) Explain Double Ended Queue. Write a C program to implement Double Ended Queue **(12)**
(b) Given the postorder and inorder traversal of a binary tree, construct the original tree: **(8)**
Postorder: D E F B G L J K H C A
Inorder: D B F E A G C L J H K

6 Explain following with suitable example (any two) **(20)**
I. B-tree and splay tree
II. Polynomial representation and addition using linked list
III. Topological Sorting

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SE | Comp | Choice Based | Sem – IV

4/12/2019

(3 hours)

Max. Marks: 80

N.B. (1) Question No. 1 is compulsory.
(2) Answer any three questions from Q.2 to Q.6.
(3) Use of Statistical Tables permitted.
(4) Figures to the right indicate full marks.

Q.1 (a) Find all the basic solutions to the following problem: 05

$$\text{Maximise} \quad z = x_1 + 3x_2 + 3x_3$$
$$\text{subject to} \quad x_1 + 2x_2 + 3x_3 = 4$$
$$2x_1 + 3x_2 + 5x_3 = 7$$
$$x_1, x_2, x_3 \geq 0$$

(b) Evaluate $\int_c \left(z - z^2\right) dz$, where c is upper half of the circle $|z| = 1$. 05

(c) Ten individual are chosen at random from a population & heights are found to be 63, 63, 64, 65, 66, 69, 69, 70, 70, 71.inches. Discuss the suggestion that the height of universe is 65 inches. 05

(d) If $A = \begin{bmatrix} 2 & 3 \\ -3 & -4 \end{bmatrix}$, find A^{100} 05

Q.2 (a) Evaluate $\int_c \frac{z+2}{(z-3)(z-4)}\, dz$, where c is the circle $|z| = 1$ 06

(b) An I.Q. test was administered to 5 persons and after they were trained. The results are given below. 06

	I	II	III	IV	V
I.Q. Before training	110	120	123	132	125
I.Q. after training	120	118	125	136	121

Test whether there is any change in I.Q. after the training programme, use 1% LOS.

(c) Solve the following LPP using Simplex Method 08

$$\text{Maximise} \quad z = 4x_1 + 10x_2$$
$$\text{subject to} \quad 2x_1 + x_2 \leq 10$$
$$2x_1 + 5x_2 \leq 20$$
$$2x_1 + 3x_2 \leq 18$$
$$x_1, x_2 \geq 0$$

Q.3 (a) Find the Eigen values and Eigen vectors of the following matrix. 06

$$A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$$

[Turn over

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(b) If the height of 500 students is normally distributed with mean 68 inches and standard deviation 4 inches. Find the expected number of students having heights between 65 & 71 inches. 06

(c) Obtain Taylor's and Laurent's expansions of $f(z)=\dfrac{z^2-1}{z^2+5z+6}$ around $z=0$ 08

Q.4 (a) A machine is claimed to produce nails of mean length 5 cms & standard of 0.45 cm. A random sample of 100 nails gave 5.1 as their average length. Does the performance of the machine justify the claim? Mention the level of significance you apply. 06

(b) Using the Residue theorem, Evaluate $\int_0^{2\pi} \dfrac{d\theta}{5+3\sin\theta}$ 06

(c) (i) In a certain manufacturing process 5% of the tools produced turnout to be defective. Find the probability that in a sample of 40 tools at most 2 will be defective.

(ii) A random variable x has the probability distribution 04+04

$P(X=x_i)=\frac{1}{8}{}^3C_x$, $X=0,1,2,3$. Find the moment generating function of x

Q.5 (a) Check whether the following matrix is Derogatory or Non-Derogatory:

$$A=\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$ 06

(b) In an industry 200 workers employed for a specific job were classified according to their performance & training received to test independence of training received & performance. The data are summarized as follows. 06

Performance	Good	Not good	Total
Trained	100	50	150
Untrained	20	30	50
Total	120	80	200

Use χ^2-test for independence at 5% level of significance & write your conclusion.

(c) Use the dual simplex method to solve the following L.P.P. 08

Minimise $z=2x_1+x_2$

subject to $3x_1+x_2\geq 3$

$4x_1+3x_2\geq 6$

$x_1+2x_2\leq 3$

$x_1,x_2\geq 0$

[Turn over

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Q.6 (a) Show that the matrix A satisfies Cayley-Hamilton theorem and hence find A^{-1}. 06

Where $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$

(b) A discrete random variable has the probability density function given below 06

$X = x_i$	-2	-1	0	1	2	3
$P(x_i)$	0.2	K	0.1	2K	0.1	2K

Find K, Mean, Variance.

(c) Using Kuhn-Tucker conditions, solve the following NLPP 08

Maximise $z = 2x_1^2 - 7x_2^2 + 12x_1x_2$

subject to $2x_1 + 5x_2 \leq 98$

$x_1, x_2 \geq 0$

----------END----------

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9/12/2019

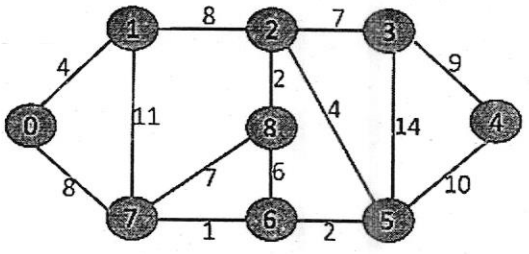
Comp/ Sem-IV/ Choice based

(3 Hours) [Total Marks : 80]

N.B.: (1) **Question No. 1** is **compulsory**.
(2) Attempt **any three** out of the remaining **five** questions.
(3) Assumptions made should be **clearly stated**.

1. (a) Explain recurrences and various methods to solve recurrences. **5**
   (b) Differentiate between P and NP. **5**
   (c) Differentiate between Prims and Kruskals algorithm. **5**
   (d) Explain Dynamic programming with example. **5**

2. (a) Define Branch and Bound and Explain 15 Puzzle problem. **10**
   (b) Apply dijkstra's algorithm on the following graph. **10**
   Consider vertex 0 as source.



3. (a) Find Longest Common Subsequence for Following strings : **10**
   X = ababcde
   Y = bacadb
   (b) Explain Backtracking with n-queen problem. **10**

4. (a) Formulate Knapsack problem , Explain and differentiate between greedy knapsack and 0/1 knapsack. **10**
   (b) Explain Multistage graph with example. **10**

5. (a) Rewrite KMP algorithm and explain with example. **10**
   (b) Define chromatic number of graph. Explain Graph coloring algorithm. **10**

6. Write a short note on following **(any 4)** : **20**
   a) Master theorem
   b) Rabin Karp algorithm
   c) Steps for NP Completeness proofs
   d) Assembly line scheduling problem
   e) Strassen's matrix multiplication

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SE COMP SEM IV CHOICE BASED 11/12/2019

(3 Hours) [Total Marks: 80]

NB: 1. Question No.1 Compulsory.

2. Solve any THREE from Q.2 to Q.6

3. Assume suitable data whenever necessary with justification.

Q.1 Answer **any four** questions

(a) Describe the memory hierarchy in the computer system [05]

(b) Give different instruction formats. [05]

(c) Explain principle of locality of reference in detail [05]

(d) Differentiate between Memory Mapped IO and IO Mapped IO. [05]

(e) Explain Superscalar Architecture. [05]

Q.2 (a) A program having 10 instructions (without Branch and Call instructions) is executed on non-pipeline and pipeline processors. All instructions are of same length and having 4 pipeline stages and time required to each stage is 1nsec. [10]

i. Calculate time required to execute the program on Non-pipeline and Pipeline processor.

ii. Calculate Speedup.

(b) With a neat diagram , explain branch prediction in detail. [10]

Q.3. (a) Explain page address translation with respect to virtual memory and further explain TLB in detail. [10]

(b) What is "Microprogram"? Write microprogram for following operations. [10]

i. ADD R1, M, Register R1 and Memory location M are added and result store at Register R1.

ii. MUL R1, R2 Register R1 and Register R2 are multiplied and result store at Register R1.

Q.4 (a) Explain Bus Contention and different method to resolve it. [10]

(b) Define instruction pipelining and its various hazards in detail. [10]

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Q.5. (a) Explain multi core processor architecture in detail [10]

(b) Explain Booth's Multiplication algorithm and Perform $(17)_{10}$ X $(-5)_{10}$. [10]

Q.6 Write short notes on any **two** [20]

(a) Data transfer techniques

(b) Set associative cache mapping

(c) Flynn's Classification

(d) Control unit of processor

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S.E. (Computer) Sem IV Choice Base 13/12/2019

[Time: Three Hours] [Marks: 80]

Please check whether you have got the right question paper.

N.B: (1) Question No.1 is compulsory
(2) Attempt any three of remaining five questions
(3) Assume any suitable data if necessary and justify the same

Q 1	a)	Define the following terms: Resolution, Aspect Ratio, Phosphorescence and Fluorescence.	05
	b)	What is the purpose of Inside-Outside Test, explain any one method.	05
	c)	Draw the diagram of CRT and explain its working.	05
	d)	What do you understand by Control points, Degree of Continuity, Local and Global control w.r.t. Curve Generation?	05
Q 2	a)	Explain DDA Line drawing algorithm and Plot the points for line AB (A (10, 15) B (5,25) using it.	10
	b)	Explain Area subdivision algorithm for hidden surface removal.	10
Q 3	a)	What is aliasing, how it affects the appearance of an object. Explain any two Anti-aliasing methods.	10
	b)	Explain Liang Barsky line clipping algorithm, what is its benefit over Cohen Sutherland algorithm? Clip the line with co-ordinates (5, 10) and (35, 30) against the window $(x_{min}, y_{min}) = (10, 10)$ and $(x_{max}, y_{max}) = (20, 20)$.	10
Q 4	a)	What is shading? Explain Gouraud and Phong Shading with their pros and cons.	10
	b)	Explain what is meant by B Spline curve? State the various properties of B Spline curve.	10
Q 5	a)	Explain Scan line polygon fill algorithm with the help of suitable diagrams.	10
	b)	Explain the steps for 2D reflection w.r.t. line y=mx and also derive a composite transformation Matrix.	10
Q 6		Write short notes on (any two)	20
	a)	Fractals	
	b)	Sweep Representation and CSG Method	
	c)	Bezier curve and the properties	
	d)	Halftone and Dithering	

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17/12/2019.

Paper / Subject Code: 40505 / Operating System

S E (comp) Sem-IV Choice Based Dec-2019

Time: 3 Hours **Marks: 80**

1. Question 1 is compulsory.
2. Attempt any **three** from remaining five questions.
3. Assume suitable data where required.

1 a. Discuss Operating System as a Resource Manager. [5]

b. Draw process state diagram and explain the following states: [5]

1. New [5]
2. Ready [5]
3. Running
4. Wait
5. Suspended ready
6. Suspended wait

c. Describe Microkernel with a diagram.

d. Discuss the importance of "Multithreading". Differentiate between kernel and user thread.

2 a. Differentiate between short term, medium term and long term scheduler with a diagram. [10]

b. Calculate AWT, ATAT, Response Time and Throughput of the following processes using Shortest job first (Non Pre-emptive). [10]

Process	Arrival Time (ms)	Burst Time (ms)
P1	1	7
P2	2	5
P3	3	1
P4	4	2
P5	5	8

3 a. What are Semaphores? Differentiate between Counting and Binary Semaphores. Discuss Dinning Philosopher problem. [10]

b. What do you understand by a deadlock? Explain deadlock avoidance method. [10]

4 a. Explain different types of memory fragmentation. [8]

b. Compare the performance of FIFO, LRU and Optimal based on number of page hit for the following string. Frame size = 3; String (pages): 1 2 3 4 5 2 1 3 3 2 4 5 [12]

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5 a. Explain Interrupt driven IO and discuss the advantages of Interrupt driven IO over programmed IO. [10]

b. Discuss various disk scheduling methods. [10]

6. a. Discuss various File Allocation Mechanism and their advantages. [10]

b. Explain Unix iNode Structure in detail. [10]

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15/11/19

TE/COMP/SEM V/CBCS

(Time: 3 Hours) [80 Marks]

N.B. 1) Question No. 1 is compulsory.
2) Attempt any **Three** questions out of remaining.
3) Assume suitable data wherever necessary and state them clearly.

Q.1	**a)**	Explain memory banking in 8086	**5**
	b)	Explain VM, RF, IOPL, NT and TF flags of 80386 microprocessor	**5**
	c)	Write addressing modes of the following instructions i) MOV AX, [BX+SI] ii) AND CL,[2000] iii) IN AL, DX iv) JMP [BX+2] v) ADD AX,[BX+SI+5]	**5**
	d)	Explain BSR mode of 8255 PPI	**5**
Q.2	**A)**	Design 8086 based system for the following requirements i) 8086 working in minimum mode with 8MHz. ii) 64 KB EROM using 32 KB * 8 devices iii) 128 KB RAM using 64 KB * 8 devices	**10**
	B)	Draw the block diagram of PIC8259 and discuss its operation	**10**
Q.3	**A)**	Draw and explain the block diagram of PIT 8253	**10**
	B)	Draw and explain demultiplexing of address bus in 8086	**10**
Q.4	**A)**	Explain how flushing of pipeline problem is minimized in Pentium architecture	**10**
	B)	Draw and explain maximum mode configuration of 8086 system	**10**
Q.5	**A)**	Write a 8086 assembly language program with appropriate comments, to find if the given year is a leap year or not	**10**
	B)	Explain Strobed Bi-directional I/O Mode 2 operation of 8255 PPI with control word and timing diagram	**10**
Q.6	**A)**	Differentiate real mode, protected mode and virtual mode of 80386 microprocessor	**5**
	B)	Write a short note on mixed language programming	**5**
	C)	Explain the following instructions in 8086 : LAHF and XLAT	**5**
	D)	Explain data transfer modes of DMAC 8257	**5**

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$40 + 30 + 5 + 10 = 85$

TE (IT) (CM) (CBCS) 19/11/19

[Time: 3 Hrs] [Marks: 80]

Please check whether you have got the right question paper.

N.B: 1. Q. 1 is compulsory.
2. Solve any three from reaming questions.
3. Draw neat diagrams wherever necessary.

Q. 1 a) Explain types of users of the database system with suitable example & responsibilities of DBA. **(10)**
b) Explain extended ER features. **(10)**

Q. 2 a) Explain types of join with suitable example. **(10)**
b) Explain constraints in SQL. **(10)**

Q. 3 a) Explain relational algebra operators. **(10)**
b) What is Log.? Explain Log based recovery. **(10)**

Q. 4 a) What is 2PL. Explain 2PL (2- phase) Locking protocol with its types. **(10)**
b) What is trigger? Write syntax and example. **(10)**

Q. 5 a) Explain view serializability with suitable examples. **(10)**
b) What is Normalization? Explain 1NF, 2NF and 3NF with suitable is example. **(10)**

Q. 6 Write note on **(Any two)** **(20)**
a) Timestamp Based Protocol
b) Transaction state diagram
c) Functional dependency in dbms

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21/11/19.

T.E (COMP) – SEM V - Choice Base

(3 Hours) [Total Marks: 80]

Note: (1) Question 1 is compulsorys
(2) Solve any three questions out of remaining
(3) Assume suitable data wherever necessary

Q.1. (a) Explain the need of layering for communication and networking (5M)
(b) Describe in brief the concept of piggybacking. (5M)
(c) What is subnetting? What are the default subnet masks? (5M)
(d) Differentiate between TCP and UDP (5M)

Q.2. (a) Explain CSMA protocols. Explain how collisions are handled in CSMA/CD. (10 M)

(b) What is traffic shaping? Explain leaky bucket algorithm and compare it with token Bucket algorithm. (10M)

Q.3. (a) Illustrate TCP three way handshake techniques in TCP connection establishment. (10M)

(b) Explain the need for DNS (Domain Name System) and describe the protocol functioning. (10M)

Q.4. (a) Explain the difference between static and dynamic routing. Explain distance vector routing in detail. (10M)

(b) Why does data link protocol always put the CRC in a trailer rather than in a header? Given the data word "1101011011" and the divisor "10011", show the generation of cyclic redundancy check (CRC) codeword at the sender site. (10M)

Q.5. (a) Write short note on FTP. (10M)

(b) Discuss different types of guided media in detail. (10M)

Q.6. (a) What is a topology? Explain the types of topology. (10M)

(b) Explain the Go-back-N protocol. (10M)

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25/11/19

T.E / SEM V / COMP / Choice Base

(3 Hours) [Total Marks: 80]

N.B. (1) Question No. 1 is compulsory
(2) Attempt any three out of remaining five questions
(3) Assumptions made should be clearly stated

1. (a) Explain post correspondance problem. 5
   (b) Differentiate between FA and PDA. 5
   (c) Define Regular Expression and obtain a regular expression such that 5
   $L(R) = \{ w \mid w \in \{0, 1\}^* \}$ with at the most three zeros
   (d) What is ambiguous grammar? Check whether following grammar is ambiguous or not 5

   $E \rightarrow E+E \mid E*E \mid (E) \mid id$

2. (a) Design a Finite State Machine to accept following language over the alphabet {0, 1} 10
   $L(R) = \{ w \mid w$ starts with 0 and has odd length or starts with 1 and has even length $\}$

   (b) Give and explain formal definition of Pumping Lemma for Regular Language and prove that following language is not regular. 10

   $L = \{ 0^i \mid i$ is prime number $\}$

3. (a) Construct PDA accepting the language $L=\{a^{2n}b^n \mid n \geq 0\}$ 10
   (b) Consider the following grammar 10

   $S \rightarrow i\,C\,t\,S \mid i\,C\,t\,S\,e\,S \mid a$

   $C \rightarrow b$

   For the string 'ibtaeibta' find the following:

   (i) Leftmost derivation
   (ii) Rightmost derivation
   (iii) Parse tree
   (iv) Check if above grammar is ambiguous.

4. (a) Construct PDA to check $\{wcw^R \mid w \{a,b\}^*\}$ where w^R is reverse of w & c is a constant. 10
   (b) Convert following CFG to CNF 10

   S-> 0A0|1B1|BB
   A->C
   B->S|A
   C->S|ϵ

5. (a) Convert (0+1) $(10)^*$(0+1) into NFA with ε-moves and obtain DFA. 10
   (b) Construct Moore and Mealy Machine to convert each occurrence of 101 by 111. 10

6. Write short note on following **(any 2)** 20
   (a) Chomsky Hierarchy
   (b) Halting Problem
   (c) Rice's Theorem
   (e) Universal Turing Machine

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Paper / Subject Code: 31906 / Elective - I Advance Operating System

27-11-2019

T.E. / Computer / choice based / Sem - V

Duration: 3 Hrs. **Total Marks:80**

NB: (1) Question no.1 is compulsory.

(2) Attempt any three out of remaining five questions.

(3) Assume data if required.

Q1. a.) Explain Co-schedulingfor multiprocessor OS. [5]

b.) Enlist the fields of Super block. [5]

c.) What is meant by static and dynamic part of process context? [5]

d.) Give advantages and disadvantages of clock driven scheduling for RTOS. [5]

Q2 a.) Explain different design approaches of operating System [10]

b.) Discuss techniques used to overcome scalability related issues in Distributed OS. [10]

Q3 a.)Describe the structure of buffer pool. [10]

b.)Explain different Distributed computing models in detail [10]

Q4 a.)Discuss various issues of cloud OS. [10]

b.)What is page table?How to map virtual address to physical address in UNIX OS? [10]

Q5 Write short notes on : [20]

a.) Conversion of path name to an i-node in UNIX system.

b.) Virtual OS.

Q6 a.)Bring out the design issues of multiprocessor OS [10]

b.)Explain Unix file system in detail. [10]

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Paper / Subject Code: 88901 / Software Engineering

TE | Comp | Sem – VI | Choice Base

3/12/2019

Time: 3 Hours

Marks: 80

Note:- 1. Q1 is compulsory.

2. Solve any 3 question from remaining questions.

Q1 Attempt any 4

a) Define software engineering. Explain umbrella activities of software engineering. (5)
b) List out Requirement models. Explain any one of them. (5)
c) What is cost estimation? Explain LOC method. (5)
d) Illustrate design Principles. (5)
e) Explain Walkthrough. (5)
f) Differentiate between White Box and Black Box Testing. (5)

Q 2 a) Discuss different categories of risk that help to define impact values in a risk table. (10)
b) Explain software reverse engineering in detail. (10)

Q3 a) Explain cyclomatic complexity. How is it computed? (10)
b) What are the different testing types? Explain glass path testing gin detail. (10)

Q4 a) Elaborate COCOMO method of cost estimation. (10)
b) What is FTR? Explain review guidelines considered during FTR. (10)

Q5a) What is maintenance? Explain the steps for creating the maintenance log . (10)
b) What are Agile methodologies? Explain any one of them. (10)

Q6 a). Explain Coupling and Cohesion? Explain the types of cohesion with example. (10)
b) Illustrate SCM Process. (10)

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5/12/2019

TE| Comp| Sem-VI| Choice Based

(Time: 3 Hours) **Total Marks: 80**

N.B: (1) Question No. 1 is compulsory
(2) Attempt ant three questions out of remaining five questions

Q.1 (a) Enlist the different types of errors that are handled by Pass I and PassII of assembler. **[05]**
(b) Define Loader. What are different functions of loader. **[05]**
(c) Compare bottom up and top down parser. **[05]**
(d) What is the need of Intermediate code generation? Explain any two Intermediate code generation forms with example **[05]**

Q.2 (a) What is Left factoring? Find FIRST & FOLLOW for the following grammar **[10]**

$S \rightarrow Aa$
$A \rightarrow B\ D$
$B \rightarrow b \mid \epsilon$
$D \rightarrow d \mid \epsilon$

(b) What are the phases of compiler? Give working of each phase for the Following statements:- **[10]**

```
int a, b, c =1 ;
a=a*b -5*3/c;
```

Q.3 (a) Explain YACC in detail. **[10]**
(b) Explain machine independent code optimization techniques. **[10]**

Q.4 (a) Compare Compiler with Interpreter. **[05]**
(b) Define left recursion? Eliminate left recursion from the following grammar **[05]**

$S \rightarrow (L) \mid x$
$L \rightarrow L,S \mid S$

(c) Explain dynamic linking loader in detail. **[10]**

Q.5 (a) Explain with flowchart design of two pass assembler. **[10]**
(b) Explain with example conditional macro expansion. **[10]**

Q.6 (a) Explain different assembler directives with example. **[10]**
(b) Write short note on any two of the following: **[10]**
i) Syntax directed translation
ii) Code generation issues
iii) Operator precedence parsing

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TE COMP-SEM VI CHOICE BASED 10/12/2019

Time: 03 Hours **Marks: 80**

Note: 1. Question 1 is compulsory
2. Answer any three out of remaining five questions.
3. Assume any suitable data wherever required and justify the same.

Q1 a) Why is data integration required in a data warehouse, more so than in an operational application? [5]

b) Describe the steps involved in Data Mining when viewed as a process of knowledge Discovery. [5]

c) A dimension table is wide, the fact table is deep. Explain [5]

d) Elucidate Market Basket Analysis with an example. [5]

Q2 a) Suppose that a data warehouse consists of the three dimensions time, doctor and patient, and the two measures count and charge, where charge is the fee that a doctor charges a patient for a visit. [10]

(i) Draw a star schema diagram for the above data warehouse.

(ii) Starting with the base cuboid [day, doctor, patient], what specific OLAP operations should be performed in order to list the total fee collected by each doctor in 2010?

(iii)To obtain the same list, write an SQL query assuming the data are stored in a relational database with the schema fee (day, month, year, doctor, hospital, patient, count, charge).

b) Develop a model to predict the salary of college graduates with 10 years of work experience using linear regression. [10]

Years of experience (x)	Salary in $100 (y)
3	30
8	57
9	64
13	72
3	36
6	43
11	59
21	90
1	20
16	83

Q3 a) Suppose that the data for analysis includes the attribute salary. We have the following values for salary (in thousands of dollars), shown in increasing order: 30, 36, 47, 50, 52, 52, 56, 60, 63, 70, 70, 110. [10]

(i) What are the *mean, median, mode* and *midrange* of the data?

(ii) Find the *first quartile* (Q1) and the *third quartile* (Q3) of the data.

(iii)Show a *boxplot* of the data.

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b) Why is entity-relationship modeling technique not suitable for the data warehouse? How is dimensional modeling different? [10]

Q4 a) Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning? [10]

b) Consider the transaction database given below, [10]

TID	Items
10	1, 3, 4
20	2, 3, 5
30	1, 2, 3, 5
40	2, 5
50	1, 3, 5

Use Apriori Algorithm with min-support count = 2 and min-confidence = 60% to find all frequent itemsets and strong association rules.

Q5 a) Show the dendrogram created by the complete link clustering algorithm for the given set of points. [10]

	A	B
P1	2	4
P2	8	2
P3	9	3
P4	1	5
P5	8.5	1

b) What is spatial data? Explain CLARANS Extension. [10]

Q6 a) Demonstrate Multidimensional and Multilevel Association Rule Mining with suitable examples. [10]

b) What is Web Structure Mining? List the, approaches used to structure the web pages to improve on the effectiveness of search engines and crawlers. Explain Page Rank technique in detail. [10]

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$6 + 10 = 16$

T.E. (Computer Engg) Sem-VI Choice Base 12/12/2019

(3 hours) **Total marks: 80**

N.B 1) Question no 1 is compulsory
2) Attempt any **three** questions from remaining five questions
3) Assume suitable data if required
4) Draw neat diagram wherever necessary

Q.1 Answer any **Four**

a) Why digital signature and digital certificates are required? (05)

b) Explain with example keyed and keyless transposition cipher (05)

c) Explain key rings in PGP? (05)

d) What are properties of hash function? Explain role of hash function in security (05)

e) Using Chinese remainder theorem solve the following: (05)
$x \equiv 2 \pmod 3$, $x \equiv 3 \pmod 5$, $x \equiv 2 \pmod 7$, Find x?

Q.2 a) If A and B wish to use RSA to communicate securely. A chooses public key (e, n) as (7, 247) and B chooses public key (e, n) as (5, 221) (10)
i. Calculate A's Private key.
ii. Calculate B's Private Key.
iii. What will be the cipher text sent by A to B, if A wishes to send M=5 to B

b) What is meant by DOS Attack? What are different ways mount DOS attacks? (10)

Q.3 a) How does ESP header guarantee confidentiality and integrity of packet payload? (10)

b) Explain structure of DES wrt: (10)
i. Fiestel structure and its significance
ii. Significance of extra swap between left and right half blocks
iii. Expansion
iv. Significance of S-box
v. DES function

Q.4 a) What is the need of SSL? Explain SSL Handshake Protocol (10)

b) Encrypt the given message using Autokey Cipher, Key=7 and the Message is: "The house is being sold tonight". (10)

Q.5 a) Explain man in the middle attack on Diffie Hellman . Explain how to overcome the same. (10)

b) Use the playfair cipher with the keyword: "HEALTH" to encipher the message "Life is full of Surprises" (10)

Q. 6 a) Explain Kerberos in detail (10)

b) What are different types of firewall? How firewall is different than IDS? (10)

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Paper / Subject Code: 88905 / Elective - II Machine Learning

TE CM Sem-VI – choice based 16/12/19

(3 Hours) **Total Marks: 80**

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five.

1 (a) Define Machine Learning and Explain with example importance of Machine Learning [05]

(b) Explain Multilayer perceptron with a neat diagram [05]

(c) Why is SVM more accurate than logistic regression? [05]

(d) Explain Radial Basis Function with example. [05]

2. (a) What is Dimensionality reduction? Describe how Principal Component Analysis is carried out to reduce dimensionality of data sets. [10]

(b) Find the singular value decomposition of [10]

$$A = \begin{bmatrix} 2 & 2 \\ -1 & 1 \end{bmatrix}$$

3 (a) For a unknown tuple t =<Outllook =Sunny,Temperature =Cool, Wind= Strong> use naïve Bayes classifier to find whether the class for PlayTennis is yes or no. The dataset is given below [10]

Outlook	Temperature	Wind	PlayTennis
Sunny	Hot	Weak	No
Sunny	Hot	Strong	No
Overcast	Hot	Weak	Yes
Rain	Mild	Weak	Yes
Rain	Cool	Weak	Yes
Rain	Cool	Strong	No
Overcast	Cool	Strong	Yes
Sunny	Mild	Weak	No
Sunny	Cool	Weak	Yes
Rain	Mild	Weak	Yes
Sunny	Mild	Strong	Yes
Overcast	Mild	Strong	Yes
Overcast	Hot	Weak	Yes
Rain	Mild	Strong	No

(b) List some advantages of derivative-based optimization techniques. Explain Steepest Descent method for optimization. [10]

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4. (a) Given the following data for the sales of car of an automobile company for six consecutive years. Predict the sales for next two consecutive years. [10]

Years	2013	2014	2015	2016	2017	2018
Sales	110	100	250	275	230	300

(b) Explain various basic evaluation measures of supervised learning Algorithm for Classification. [10]

5. (a) Consider following table for binary classification. Calculate the root of the decision tree using Gini index. [10]

Customer Income	Gender	Car Type	Class
High	M	Family	C1
High	M	Sports	C1
High	M	Family	C2
Low	M	Family	C2
Low	F	Family	C2
Low	F	Sports	C1
Low	F	Sports	C2
High	M	Family	C1
High	F	Family	C2
High	F	Family	C2
High	F	Sports	C2
Low	M	Sports	C2
Low	F	Family	C2
Low	M	Sports	C1

(b) Define Support Vector Machine. Explain how margin is computed and optimal hyper-plane is decided. [10]

6. Write Short notes on any **four** [20]

(a) Hidden Markov Model

(b) EM Algorithm

(c) Logistic Regression

(d) McCulloch-Pitts Neuron Model

(e) DownHill simplex method.

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BE (CM) (Choiced Based) 14/11/2019

VII

(3 Hours) [Total Marks: 80]

N.B. 1) Question No. 1 is compulsory.

2) Attempt any three out of remaining five questions.

3) Figures to the right indicate full marks.

4) Make suitable assumptions wherever necessary and justify them

Q.1. a) Write a note on dynamic range compression. 4

b) Find DTFT of x(n) = {1,2,3,4} 4

c) Explain energy and power signal with examples. 4

d) Write a note on distance measures. 4

e) Explain Image segmentation. 4

Q.2. a) Explain any 5 properties of Discrete Fourier Transform 10

b) (i) Find the 4 point DFT of x(n) = {1,-1,2,-2} 10

(ii) Find the IDFT of X(k) = {1,0,1,0}

Q.3. a) For x(n) = {1,3,-1,2,0,4}, plot the following discrete time signals 10

(i) x (n+2)

(ii) x(-n-1)

(iii) 2x(n)

(iv) x(n-1). δ (n-3)

(v) x(n).u(n-2)

b) (i) Find the cross correlation of the causal sequences 10

x(n) = {1,4,7,8} and y(n) ={2,0,1,3}

(ii) Determine whether the following system is linear or non linear

y(n) = 4x(n)+ 2

Q 4. a) Determine radix 2 DIT-FFT Flow graph for 10

x(n) = {2,2,3,1}

b) Justify or Contradict 10

(i) Point processing techniques are called as Zero memory operations

(ii) To remove salt and pepper noise median filter is better than low pass filter

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Q 5. (a) Apply Horizontal and vertical line detection mask on the following 8 bits per pixel image F. Use appropriate threshold value. Assume virtual rows and Column by repeating border pixel values. 10

F =

10	15	10
200	200	200
5	20	10

b) Explain Contrast stretching. Perform Contrast stretching on the following 4 bpp images 10

r1=4, r2= 9, s1= 2, s2 = 13

4 BPP IMAGE			
7	**8**	**5**	**1**
7	**8**	**8**	**2**
5	**9**	**7**	**7**
8	**7**	**12**	**15**

Q 6. a) Write Short note on edge detection in detail 10

b) What is a Histogram and what is histogram equalization. Perform Histogram Equalization on the following 3 bpp image. Calculate the new histogram. Plot the original and new histogram and show the new image. 10

5	**0**	**7**	**7**	**1**	**4**	**5**	**2**	**0**	**1**
7	**5**	**6**	**2**	**5**	**3**	**4**	**3**	**2**	**5**
4	**3**	**6**	**2**	**7**	**3**	**2**	**4**	**3**	**5**
7	**4**	**4**	**1**	**6**	**4**	**3**	**7**	**7**	**4**
3	**2**	**5**	**1**	**1**	**1**	**1**	**5**	**4**	**0**

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BE (VII) (CBM) (Choice based) 18/11/19

Time: 3 Hours **Marks: 80**

Note:- Q 1 is compulsory

Solve any three from remaining

Each question carries 20 marks

Q1] Solve any four

A] Explain different application of mobile computing.

B] Explain concept of frequency reuse with clustering.

C] Explain IP mobility.

D] Explain characteristics of GSM standards.

E] Explain in short voice over LTE.

Q 2] a] Explain in detail GSM architecture.

B] Explain in short different algorithm used for authentication and privacy in GSM.

Q3] a] Explain hidden station and exposed station problem with solution in WLAN.

B] How is packet delivery achieved to and from mobile node?

Q 4] a] Explain DSDV routing protocol used in ad-hoc network.

B] Explain protocol architecture of IEEE 802.11.

Q 5] a] Explain Bluetooth protocol stack in detail.

B] Explain different security threats in WLAN and discuss the available solutions.

Q 6] A] Explain different components used in LTE architecture with diagram.

B] Explain various nodes present in E-UTRAN architecture.

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B.E (Computer) Sem-VII choice based 20/11/19

(3 Hours) (Total Marks : 80)

Note: 1. Question 1 is compulsory.
2. Attempt any 3 from Q2 to Q6.
3. Indicate your answer with various sketches whenever necessary.

Q1 Attempt any **four.** **[20]**

(a) State PEAS Description for online English tutor.

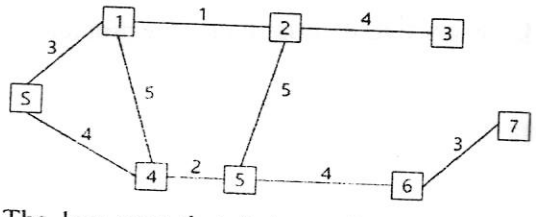
(b) Differentiate between Soft and Hard computing.

(c) Give Local and Global heuristic function for block world problem.

(d) Give different membership functions of fuzzy logic.

(e) Determine (alfa) α-level sets and strong α-level sets for the following fuzzy sets. A={(1,0.2), (2,0.5), (3, 0.8), (4,1), (5, 0.7), (6,0.3)}

Q2 (a) Consider the graph given in Figure 1 below. Assume that the-initial state is S and the goal state is 7. Find a path from the initial state to the goal state using A* Search. Also report the solution cost. The straight line distance heuristic estimates for the nodes are as follows: h(1)=14, h(2)=10, h(3)=8, h(4)=12, h(5)=10, h(6)=10, h(S)=15. **[10]**



(b) The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove that Col. West is a criminal using resolutfion technique. **[10]**

Q3 (a) Implement AND function using perceptron networks for bipolar inputs and targets. **[10]**

(b) Explain fuzzy controller system for a tipping example.Consider service and food quality rated between 0 and 10. use this to leave a tip of 25%. **[10]**

Q4 (a) Design a Mc-Culloh Pitts model for XOR Gate. **[10]**

(b) Construct kohonen Self-organizing map to cluster the four given vectors, **[10]**

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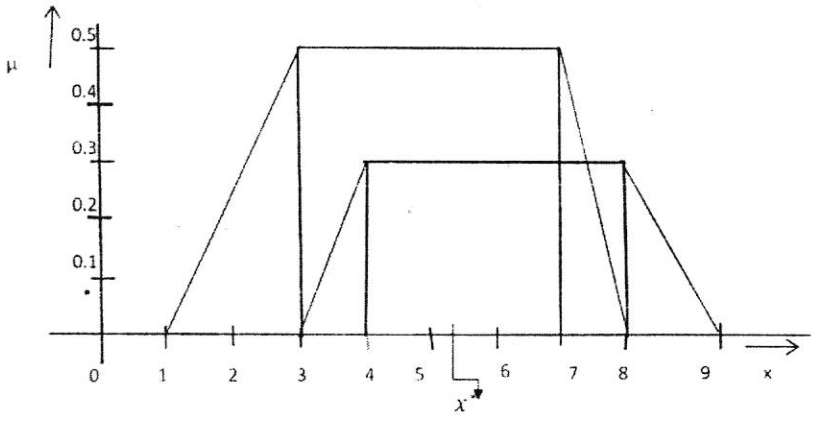
[0 0 11], [1 0 0 0], [0 11 0] and [0 0 0 1]. The number of cluster formed is two. Assume an initial learning rate of 0.5.

Q5 (a) Explain defuzzification techniques. Apply defuzzification by using Center of Gravity (CoG) method on the following: **[10]**



(b) Explain planning problem in AI. What are different types of planning? Consider problem of changing a flat tire. The goal is to have a good spare tire properly mounted on to the car's axle, where the initial state has a flat tire on the axle and a good spare tire in the trunk. Give the ADL description for the problem. **[10]**

Q6 Write Short notes on following **(Any Four)** **[20]**

(a) Genetic algorithm

(b) ANFIS

(c) Hill Climbing algorithm

(d) Wumpus world knowledge base

(e) Different types of Neural Networks

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B.E/SEM VII/ COMP/ Choice Base

[Total Marks 80]

(3 Hours)

N. B:

1. Question **No. 1 is Compulsory**.
2. Solve any **THREE** from Question No. 2 to 6.
3. Draw neat well labeled diagram wherever necessary

Q. 1	**a)**	Explain access control policies in detail.	**(05)**
	b)	Describe the concepts of covert channel in detail.	**(05)**
	c)	What is the concept of cross site scripting? Describe with example.	**(05)**
	d)	Explain the cybercrimes in detail.	**(05)**
Q. 2	**a)**	Describe session hijacking in detail.	**(10)**
	b)	Explain salami attack and linearization attack.	**(10)**
Q. 3	**a)**	What is phishing and pharming? Explain it with example.	**(10)**
	b)	Explain bell-La Padula model with neat diagram.	**(10)**
Q. 4	**a)**	Explain possible attacks on wireless LAN in detail.	**(10)**
	b)	Describe copyrights and intellectual property in details.	**(10)**
Q. 5	**a)**	Explain in details wireless security offered by 802.11 with neat diagram.	**(10)**
	b)	Describe incident response methodology with diagram.	**(10)**

Q. 6 Write short note on: **(20)**

1. Windows vulnerabilities
2. Operating system security
3. Federated Identity Management
4. Forensic duplication

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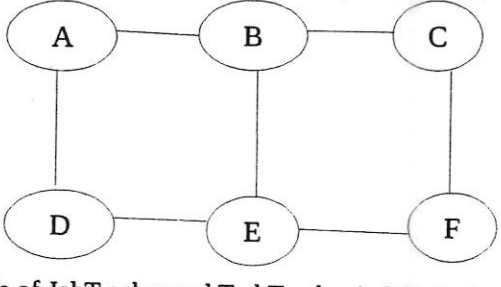
B.E/ SEM VII / COMP / Choice Base

(3 Hours)

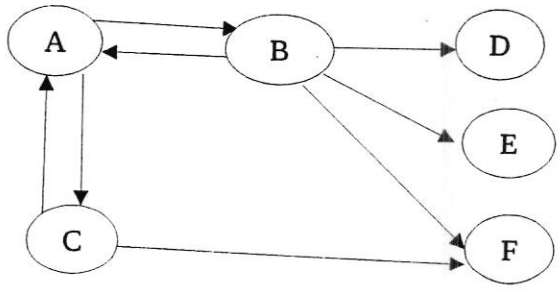
[Total Marks 80]

i. Q.1 is compulsory
ii. Attempt any three from the remaining
iii. Assume suitable data

Q.1	(a)	Explain Edit distance measure with an example.	(5)
	(b)	When it comes to big data how NoSQL scores over RDBMS.	(5)
	(c)	Give difference between Traditional data management and analytics approach Versus Big data Approach	(5)
	(d)	Give Applications of Social Network Mining	(5)
Q.2	(a)	What is Hadoop? Describe HDFS architechure with diagram.	(10)
	(b)	Explain with block diagram architechure of Data stream Management System.	(10)
Q.3	(a)	What is the use of Recommender System. How is classification algorithm used in recommendation system.	(10)
	(b)	Explain the following terms with diagram 1) Hubs and Authorities 2) Structure of the Web	(10)
Q.4	(a)	What do you mean by Counting Distinct Elements in a stream. Illustrate with an example working of an Flajolet – Martin Algorithm used to count number of distinct elements.	(10)
	(b)	Explain different ways by which big data problems are handled by NoSQL.	(10)
Q.5	(a)	Describe Girwan – Newman Algorithm. For the following graph show how the Girvan Newman algorithm finds the different communities.	(10)



	(b)	What is the role of JobTracker and TaskTracker in MapReduce.Illustrate Map Reduce execution pipeline with Word count example.	(10)
Q.6	(a)	Compute the page rank of each page after running the PageRank algorithm for two iterations with teleportation factor Beta (β)value = 0.8	(10)



	(b)	What are the challenges in clustering of Data streams. Explain stream clustering algorithm in detail.	(10)

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(3 Hours) (Total Marks : 80)

N.B: 1) **Q.1** is **compulsory.**
2) Attempt **any THREE** questions from the remaining questions.
3) Assume suitable **data** if **necessary.**

Q.1 Attempt **any four** :

a) Compare active attacks vs Passive attacks. [5]

b) Explain various types of key-loggers in brief. [5]

c) Classify the cybercrimes and explain any one briefly. [5]

d) Explain how the appeals can be made under The IT ACT 2000. [5]

e) Write brief note on : Cyber-terrorism. [5]

Q.2 a) How criminals plan the attack? Discuss various steps involved [10]

b) Explain how Intellectual property laws protect the rights of the owner of the intellectual Property. [10]

Q.3 a) Compare Vishing, Phishing and Smishing in cyber security. [10]

b) What is E-commerce? Explain different types of e-commerce with suitable examples. [10]

Q.4 a) What is Bluetooth hacking? Explain Bluetooth hacking tools in brief. [10]

b) How the Indian penal code IPC 1860 addresses cybercrime? [10]

Q.5 a) Discuss basic security precautions to be taken to safeguard Laptops and wireless devices. [10]

b) What is E-contract? Discuss E-contract Act 1872. [10]

Q.6 Write short note on **(Any 2)** : [20]

1) Computer Sabotage.
2) Indian Information Technology Act 2000
3) Write key IT requirements for SOX and HIPAA.

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