M.Sc (Comp. Science) (Part-II)
Artificial Intelligence &
Image Processing
(OCT-16)

QP Code : 76138

(3 Hours)

[75 marks]

N.B:

1. attempt any three questions from each section
2. Answers to the two sections must be written in same answer sheet.
3. Figures to the right indicate full marks.
4. Assume additional data if necessary but state the same clearly.
5. Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
6. Use of Simple calculators and statistical tables is allowed.

Section I

Q1	A	Consider the list L1{X,Y,Z} , L2{M,N,O,X,Y}. And give the output for the following:
		  i. (union L1 L2)
		  ii. (Length (cdr L2))
		  iii. (equal L1 L2)
			6

	B	State and explain any three list constructs.	6
Q2	A	What are bivalent paradoxes? Show that bivalent paradoxes are half truths.	6
	B	What is crossover? Explain how it is been carried out.	6
Q3	A	Explain fuzzy associative memory (FAM) rules using an example	6
	B	Explain the role of neural and Fuzzy System as model-free function	6

Q4	A	What is schema in Genetic Algorithm? What is effect of the following genetic operators on schema?
		  1. Reproduction
		  2. Mutation
		  3. Crossover
			6

	B	Describe the minimum Deception problem occurred in Genetic Algorithm	6
Q5	A	State any three differences between data mining and query tools.	6
	B	Explain single perceptron model with neat diagram.	6

Section II

6	A	How image is formed in Human eye?	6
	B	Short note on (a)DFT. (b)Walsh transform.	7
7	A	Explain Histogram Processing.	6
	B	What do you mean by frequency domain filter? Explain Homomorphic	7

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filtering.

8	A	Explain dilation and Erosion.	6
	B	Short note on Morphological algorithm operations on grey-scale image.	7
9	A	Explain Edgelinking and Boundary detection.	6
	B	Differentiate between Error free compression and Lossy compression.	7
10	A	Write short note on Image Sampling and Quantization.	6
	B	What is Boundary descriptors, Regional descriptors ?	7

M.Sc (Comp. Science) (Part-II)
Distributed Computing & Embedded Systems
(OCT-16)

QP Code : 76208

(3 Hours)

[75 marks]

N.B:

1. attempt any three questions from each section
2. Answers to the two sections must be written in same answer sheet.
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6. Use of Simple calculators and statistical tables is allowed.

Section I

1	A	What is the role of middleware in a distributed system?	6
	B	Describe the different forms of communication in distributed system.	6
2	A	How does Java RMI rely on code migration?	6
	B	How does distributed hashing protocol work with the aid of finger table? Illustrate with diagram.	6
3	A	What is mutual exclusion? Compare the performance of the central server algorithm and the token ring algorithm for mutual exclusion.	6
	B	Discuss the design and the implementation issues of cache coherence protocol in the Client centric consistency model.	6
4	A	Explain three phase commit protocol.	6
	B	What are the different security threats that can occur in mobile code.	6
5	A	How the Coda file system accommodates file sharing?	6
	B	Should the client and server side CORBA objects for asynchronous method invocation be persistent?	6

Section II

6	A	Why time to market is a demanding design metric in embedded system?	6
	B	Write a short note Full custom IC technology and Semi custom IC technology.	7
7	A	Explain the deadlock situation. Explain what are the different strategies for dealing with deadlock situation?	6
	B	What is the performance design metric of embedded system? Explain	7
8	A	Consider the following C code. Write an appropriate assembly code for it **while (x < 1000)** { ... }	6
	B	Write a short note on Inter-process communication.	7
9	A	Explain the function of following "C" statements i. PORTA=0x02;	6

		ii. X=PINA;	
		iii. DDRA=0xC0;	
	B	Explain the working of Multiplexed/ Demultiplexed scanned Keyboard	7
10	A	Write a C code to initialize and activate External interrupt 0 to rising edge, when input is given to external interrupt pin.	6
	B	Define Timer and Counters. Explain the working of Timer 0.	7

M.Sc (Comp. Science) (Part-II)
Elective : I
Enterprise Networking & Satellite Communication
(OCT-16)

QP Code : 76337

(3 hours) [75 marks]

N.B:
1. attempt any three questions from each section
2. Answers to the two sections must be written in same answer sheet.
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6. Use of Simple calculators and statistical tables is allowed.

Section I

1	A	How does one decide the size of a packet? Justify your answer.	6
	B	Discuss the technical requirements in planning the Enterprise Network.	6
2	A	Write Short note on: Unshielded Twisted Pair(UTP)and Shielded Twisted Pair(UTP).	6
	B	What is the need of Asynchronous Communication? Explain half and full duplex Asynchronous Communication.	6
3	A	What are modems? How do dial-up modems differ from 4-wire modems?	6
	C	What is router? Give its working, advantages and disadvantages.	6
4	A	Discuss the components and functions of Network Interface Card(NIC).	6
	B	Elaborate on techniques of parity bit and checksum with appropriate examples.	6
5	A	Explain the FDDI network.	6
	B	Define routing table. How it gets updated? And hence state the Dijkstra's algorithm used in routing.	6

Section II

6	A	What are the different types of satellite (Based on orbits)? Explain any two in brief.	6
	B	Explain Kepler's Second law.	7
7	A	Define Universal time. Calculate time in days, hours and seconds for epoch day 324.956.	6
	B	Define the following:	7
		a) Apogee and Perigee	
		b) Line of Apsides	
		c) Ascending and Descending Nodes	
		d) Line of Nodes	
		e) Prograde and Retrograde Orbits	
		f) Argument of Perigee	
		g) Right ascension of ascending node	
8	A	Discuss ionosphere scintillation	6
	B	Write a note on Gregorian Antenna?	7

9	A	Write a short note on HORN Antenna.	6
	B	Elaborate on the bus system of the communication satellites.	7
10	A	Discuss the features of CDMA.	6
	B	Write a short note on Orbital Debris? How do they harm the Satellites?	7

M.Sc (Comp. Science) (Part-II)
Elective : II
Optimization Techniques &
Customer Resources Management
(OCT-16)

(hours)

QP Code : 76475

[Total marks: 75]

N. B.:
(1) Attempt any **three** questions from **each section**.
(2) Answers to the two sections must be written in **same answer sheet**.
(3) Figures to the right indicate full marks.
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(6) Use of simple calculators and statistical tables are allowed.

Section I

1 a. A company manufactures some medicine in two sizes A and B. Size A contains 2 grains of   6
aspirin, 5 grains of bicarbonate and one grain of codeine. Size B contains 1 grain of aspirin, 8
grains of bicarbonate and 6 grain of codeine. It has been found that it requires at least 12
grains of aspirin, 74 grains of bicarbonate and 24 grain of codeine for providing immediate
relief. Determine least number of pills a patient should take to get immediate relief.
Formulate this problem and solve it graphically.

   b. What is sensitivity analysis? Give example.   6

2 a. Explain the following terms related to linear programming problem: 6
(i) Basic feasible solution
(ii) Non-degenerete basic feasible solution
(iii) Primal and dual L.P.P.

   b. Solve the following L.P.P. by Simplex method: 6
Max $Z = 5X_1 + 6X_2 + X_3$
Subject to $9X_1 + 3X_2 - 2X_3 \leq 5$
$4X_1 + 2X_2 - X_3 \leq 2$
$X_1 - 4X_2 + X_3 \leq 3$
$X_1, X_2, X_3 \geq 0$

3 a. Write down the dual of the following primal L.P.P. Solve this primal by Big M method, and   6
hence determine solution of dual problem from the optimal simplex table of primal.
Min $Z = 300X_1 + 110X_2$
Subject to $30X_1 + 5X_2 \geq 6$
$20X_1 + 10X_2 \geq 8$
$X_1, X_2 \geq 0$

   b. Discuss two phase method of solving an L.P.P.   6

4 a. Obtain an initial basic feasible solution to the transportation problem by Vogel's   6
Approximation method. Is this solution an optimal solution? If not, improve the solution to
obtain an optimal solution.

		Depot					Availability
		A	B	C	D	E	
Centre	P	4	1	3	4	4	60
	Q	2	3	2	2	3	35
	R	3	5	2	4	4	40
Requirement		22	45	20	18	30	

   b. Discuss North West Corner method of obtaining an initial basic feasible solution to a   6
transportation problem.

5 a. Discuss briefly Monte-Carlo simulation technique.   6

   b. Solve the following assignment problem: 6

	A	B	C	D	E
1	32	25	22	34	22
2	22	38	35	41	26
3	22	30	29	32	27
4	37	24	22	26	26
5	33	0	21	28	23

Section II

6 a. What are CRM technology components? Explain CRM engine, front office solutions and   6
       Enterprise Application Integration.

   b. What is E-CRM? Explain its applications.   7

7 a. What is the barrier in successful Sales Force Automation (SFA)? Explain giving example.   6

   b. State and explain different Sales Force Automation (SFA) functionalities.   7

8 a. Explain in detail, what are different features of business analytic tools?   6

   b. Write a short note on Enterprise Marketing Automation.   7

9 a. Write a short note on Development of Customization.   6

   b. Explain the requirement gathering phase of CRM.   7

10 a. What is Workforce Management Software (WFM)? Why should it be on the top of call   7
       routing software?

   b. What is application service provider (ASP)? What are the disadvantages of implementing   6
       ASP? Discuss these disadvantages with reference to:
       (i) Small industries
       (ii) Medium scaled industries
       (iii) Large business houses

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