

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

- | | | | |
|---|---|---|---|
| 1 | A | What is importance of Artificial Intelligence in Computer Science? | 6 |
| | B | Discuss the theory of Fuzzy sets wit example. | 6 |
| 2 | A | Define neurons mathematically. | 6 |
| | B | Describe Data Mining technique using K-nearest neighbor | 6 |
| 3 | A | Write a short note on slot and assertion notation | 6 |
| | B | Explain minimal Deceptive problem. | 6 |
| 4 | A | How does the predicate logic help for knowledge representation? Explain with example. | 6 |
| | B | What is basic flow of control in Lisp? | 6 |
| 5 | A | What is inductive learning ? Explain decision tree with example. | 6 |
| | B | State and explain Schema Theorem of Genetics Algorithm. | 6 |

Section II

- | | | | |
|----|---|---|---|
| 6 | A | Explain the term
(a) Thresholding (b) Log Transformation (c) Negative Transformation | 6 |
| | B | How image is formed in Human eye? | 7 |
| 7 | A | Write a short note on Sampling and Quantization. | 6 |
| | B | What are different fields where image processing are used? | 7 |
| 8 | A | Explain the terms: (a)Smoothing (b) Sharpening | 6 |
| | B | Write a short note on DFT | 7 |
| 9 | A | Explain Dilation and Erosion and explain how opening and closing are related with them. | 6 |
| | B | What do you mean by Image Segmentation? | 7 |
| 10 | A | What is Structuring Element? What is the use of it in morphological operation? | 6 |
| | B | Explain the term Boundary descriptors, Regional descriptors. | 7 |

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Section I

- | | | | |
|---|---|--|---|
| 1 | A | What is MPI? Discuss the various operations involved in the working of MPI. | 6 |
| | B | Explain different types of transparency in distributed system with the help of example. | 6 |
| 2 | A | Describe the working of DHT in the design of CHORD. Illustrate with a diagram. | 6 |
| | B | Explain in detail different approaches for locating a mobile entity? | 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 | Compare two phase and three phase commit protocol. | 6 |
| | B | Discuss the different types of failure models in distributed system. | 6 |
| 5 | A | Discuss client side caching in CODA. | 6 |
| | B | Illustrate with an example the implementation of an object reference that allows a client to bind to a remote object in CORBA. | 6 |

Section II

- | | | | |
|---|---|--|---|
| 6 | A | What are the hardware and software co-design used in design of Embedded systems. | 6 |
| | B | Explain the following Embedded system design challenges | 7 |
| | | 1. Power | |
| | | 2. NRE Cost | |
| | | 3. Size | |
| 7 | A | What are real time methods? Explain them in detail. | 6 |
| | B | Explain build and load process of embedded system with suitable diagram. | 7 |
| 8 | A | Consider the following C code. Write an appropriate assembly code for it | 6 |
| | | <pre>if (x <= y) { x = 4 ; } else { y = 6 ; }</pre> | |

TURN OVER

- B Write a short note on different types of display units. 7
- 9 A Write a C language code to initialize External _Interrupt_0 to activate on rising edge, applied to the external interrupt pin. 6
- B Explain Serial communication in embedded system. 7
- 10 A Define an interfacing. Explain the role of device driver for the same. 6
- B Explain watchdog timer and its use. 7

M.Sc (Comp.Sci.) [Part – II]

(Elective – I)

*Enterprise Networking
& Satellite Communication*

(May-2017)

Q.P.Code: 10469

(3 Hours)

[Marks: 75]

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Section I

- | | | | |
|---|---|--|---|
| 1 | A | Write a short note on Half and Full Duplex Asynchronous Communication in RS-232. | 6 |
| | B | Explain the implementation of CSMA/CD and CSMA/CA. | 6 |
| 2 | A | Explain Multicast Addressing in detail with an example. | 6 |
| | B | How does a 'Cycle of Bridges' form? Explain with a neat diagram. How the problem of looping is prevented in this case? | 6 |
| 3 | A | What is Multiplexing? Explain Wavelength Division? Time Division and Spread Spectrum Multiplexing. | 6 |
| | B | Explain the different Satellite configurations used for data transmission. | 6 |
| 4 | A | Explain the following network performance characteristics: a. Delay and b. Throughput. | 6 |
| | B | State examples of WAN Technologies and briefly explain any three. | 6 |
| 5 | A | Explain Dijkstra's Shortest Path computation algorithm with a neat diagram. | 6 |
| | B | Explain the fundamental quantitative measures of a network and explain how they relate to capacity. | 6 |

Section II

- | | | | |
|---|---|--|---|
| 6 | A | Explain the different Keplerian orbital elements. | 6 |
| | B | What is System Noise? Therefore, explain Antenna Noise. | 7 |
| 7 | A | Explain Hohmann's Transfer orbit. | 6 |
| | B | What is Radio Wave Propagation impairment? Explain its causes. | 7 |
| 8 | A | Explain Intermodulation Noise. | 6 |
| | B | What are the causes of Depolarisation? Explain any two. | 7 |

TURN OVER

- 9 A Explain the terms ‘Sidereal Time’ and ‘Orbital Plane’ using suitable diagrams. 6
- B Explain parabolic reflectors. 7

- 10 A What are the issues faced by communication satellites with respect to Lifetime and Reliability? 6
- B Explain the terms “up-link” and “down-link” for a communication satellite. 7
- Derive an expression for saturation flux density in terms of EIRP.

M.Sc (Comp.Sci.) [Part – II]

(Elective – II)

**Optimization Techniques
& Customer Resources Management
(May-2017)****Q.P.Code: 10476****[3 Hours]****[75 Marks]**

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Section I

- 1 A Explain optimization and its role in decision making process. 6
 B A diet for 6 persons contains at least 4000 units of Vitamins, 50 units of Minerals & 1400 calories. Two foods A & B are available at the cost of Rs 4 and Rs 3 per unit respectively. If 1 unit of A contains 200 units of Vitamin, 1 unit of mineral and 40 calories and 1 unit of B contains 100 units of Vitamin, 2 units of mineral and 40 calories . Using graphical method find what combination of food should be used to have least cost. 6
- 2 A In linear programming explain the following terms: 6
 1. Basic feasible solution
 2. Unbounded solution
 3. Surplus variable
- B Solve the following using simplex method using Big M method 6
 Minimize $Z=36x_1+40x_2+28x_3$
 Subject to constraints:
 $6x_1+5x_2+2x_3 \geq 5$
 $2x_1+5x_2+4x_3 \geq 23$
 $x_1, x_2, x_3 \geq 0$
- 3 A Explain any 2 special cases with respect to optimum solution. 6
 B Obtain IBFS for the following transportation problem by using VAM method to maximize the profit for the following rates. Further find the optimum solution. 6

	P	Q	R	S	Avail
A	15	51	42	33	23
B	30	42	26	81	44
C	90	40	66	60	33
Demand	23	31	16	30	

TURN OVER

- 4 A Explain Hungarian method to solve assignment problems. 6
 B Owner of small machine shop has 4 workers available to assign jobs for 6
 different days. 5 jobs are offered with expected profit for each worker on
 each job as follows.
 Find the assignments of the workers to job that will result in maximum profit
 and which job should be declined.

	1	2	3	4	5
A	62	78	50	101	82
B	71	84	64	73	59
C	87	92	111	71	81
D	48	64	87	77	80

- 5 A Explain Monte Carlo method with its function. 6
 B Write a short note on Cutting plane algorithm. 6

Section II

- 6 A The customer is King- Justify the statement with example. 6
 B Define Customer. What are the different types of Customers? 7
- 7 A Differentiate between Operational CRM, Analytical CRM and 6
 Collaborative CRM.
 B Discuss the traditional measurements of success with respect to CIC. 7
- 8 A State and explain the different Sales Force Automation Functionality. 6
 B Advantages and Disadvantages of Sales Force Automation 7
- 9 A Write a note on Web enabling Call Centre. 6
 B Write a note on Interactive Voice Response (IVR). 7
- 10 A Discuss the benefits of a Company to support an ASP by paying a 6
 monthly service fee.
 B Why most ASP's advertise 24/7/365 uptime for their customers? 7