M.SC (COMPUTER SCIENCE) PART-II

ARTIFICIAL INTELLIGENCE & IMAGE PROCESSING

(JUNE - 2018)

Q. P. Code: 21515

[Time: 3 hrs] **[Marks: 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

1	A	Explain the following:- i) Predicates and Arguments ii) Connectives Variables iii) Quantification	6
	B	Explain the following: i) The Isa Hierarchy ii) Slot-Assertion Notation iii) Frame Notation	6
2	A	Write a Lisp function mymember which is replica of member function.	6
	B	Classify and state different neural network models.	6
3	A	Explain Fuzzy systems and its applications.	6
	B	Explain Fuzzy systems as Principle based Systems.	6
4	A	Explain the following: i) Computer implementation of Genetic algorithm ii) Data Structures iii) Reproduction iv) Cross over v) Mutation	6
	B	Explain the applications of genetic based machine leaning	6
5	A	Explain the Real life applications of Data Mining.	6
	B	Explain the need of the following in context to data mining i) K- nearest neighbor ii) Decision trees iii) OLAP tools	6

Section II

6	A	How human can see whole world with his eye naturally?	6
	B	Give basic relationship between the pixel when we are going to store image in Computer memory.	7
7	A	Write a short note on (i) Walsh transformation (ii) Discrete Cosine Transformation	6
	B	What is the use of Arithmetic and logical operation in Image enhancement?	7
8	A	What do you mean by Opening and Closing in image processing and what is the relation with Dilation and erosion?	6
	B	How Image compression is useful when handling digital image?	7
9	A	Write a short note on Edge Linking and Boundary detection.	6
	B	What do you mean by region based Segmentation? Explain.	7
10	A	What is Hotelling transformation.? Explain.	6
	B	Write a short note on Subband Coding.	7

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M.SC (COMPUTER SCIENCE) PART-II

DISTRIBUTED COMPUTING & EMBEDDED SYSTEMS

(JUNE - 2018)

Q. P. Code: 39809

3 Hours **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.
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	Define Distributed System. What are three main goals of a distributed system?	**6**
	B	What is RPC? Differentiate between static and dynamic Remote method Invocation.	**6**
2	A	Discuss the reasons for the Code Migration. Why it is needed?	**6**
	B	Describe how to locate mobile Entities?	**6**
3	A	Define clock synchronization. Explain any two clock synchronization Algorithms	**6**
	B	What are Transaction models? Give the classification of Transactions?	**6**
4	A	Explain types of Data-Centric consistency models	**6**
	B	When the system is said to be fault tolerant? What are the types of system failures?	**6**
5	A	Define Distributed commit. Explain two-phase commit with neat and labeled diagram	**6**
	B	Discuss the security threats often experienced in a distributed system. Define Authentication.	**6**

Section II

6	A	Differentiate between RISC & CISC Processors.	**6**
	B	What is an embedded system? Explain in Brief about different areas of Embedded System Applications.	**7**
7	A	Explain different types of display units.	**6**
	B	Write a short note on Device Drivers.	**7**
8	A	Write a C language code to initialize external_internal_0 to activate on rising edge applied to the external interrupt pin.	**6**
	B	What types of files can be included using preprocessor directive.	**7**
9	A	List and define different DMA Cycles.	**6**
	B	Explain different terminology used in memory system design.	**7**
10	A	Explain static and Dynamic memory allocation in details.	**6**
	B	Elaborate recent processor trends in embedded system.	**7**

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M.SC (COMPUTER SCIENCE) PART-II

-: ELECTIVE - I:-

ENTERPRISE NETWORKING AND SATELLITE COMMUNICATION

(JUNE - 2018)

Q. P. Code: 39438

Time: 3 hours Marks: 75

Please Note:

[1] Attempt any three from each Section
[2] Answers to the two sections must be written in separate answer sheets
[3] Figures to the right indicate full marks
[4] Assume additional data if necessary, however, the same must be stated clearly
[5] Symbols have their usual standard meanings and Tables have their usual standard structure unless stated otherwise
[6] Use of **simple** (**non-programmable**) calculators and statistical tables are allowed

Section I

1. A	What are Channelization Protocols? Briefly explain each protocol.	6
1. B	State Nyquist theorem and explain its components.	6
2. A	Explain the concept of Space Division Multiplexing and mention its applications.	6
2. B	What is a Spanning Tree Protocol (STP)? Briefly explain its operation. How are ties broken in STP?	6
3. A	Which form of channel coding is used in high-speed data networks? Explain the same with an example and a suitable diagram.	6
3. B	What is Distributed Route Computation (DRC)? What are the general approaches followed for DRC? Compare the same.	6
4. A	What is meant by (i) Bandwidth, (ii) Baud, (iii) Symbol and (iv) bit rate? A 2400-baud line transmits one symbol about every 416.667µsec. If the symbol consists of voltages 0, 1, 2, 3, 4, 5, 6, 7 find: [a] Bits/symbol, [b] Symbol rate, [c] Data rate (bit rate). Also compute the Baud rate of a line that has a bit rate of 14,400bps. The line transmits 6 data bits and 1 parity bit per sample.	6
4. B	A voice telephone system has a signal to noise ratio (SNR) of approximately 30 dB and an analogue bandwidth of approximately 3300 Hz find the effective channel limit on the system's channel capacity.	6
5. A	What is Network Latency? What are the different types of latencies? Explain any three.	6

5. B Briefly describe the how the wireless LAN protocol CSMA/CA is able to control the hidden station and exposed station problem with suitable diagram. In case a flowchart is drawn, in addition to the diagram, no separate explanation is required. 6

Section II

6. A Explain Rain attenuation with an example and suitable diagrams. Derive the equation for the same. 6

6. B An earth-station is located at 48.42° north and 89.26° west. Ignore the altitude of the earth-station and assume a spherical Earth of mean radius 6371 km. a_{GSO} = 42164 km. For the given data compute:
[i] Angle of tilt required for a polar-mount antenna.
[ii] The limits of visibility for the above earth-station situated at mean sea level with a minimum angle of elevation of 5.125 ° 7

7. A Explain the Coordinate System for Antennas. 6

7. B A GEO satellite is positioned at 115° W and sends a vertically polarized wave. Determine its angle of polarization at an Earth station positioned 28° N latitude and 75° W longitude. The average radius of the earth is 6371 km. and a_{GSO} = 42164 km. 7

8. A What are Shaped Reflector Systems? Explain the Design, Performance and Application attributes for the same using suitable diagrams. 6

8. B Write a note on Satellite-Switched TDMA using suitable diagrams. 7

9. A What are Repeaters? Compare any two repeaters that you know. 6

9. B Explain the significance of Antenna Mounts including the most commonly used antenna mounts. 7

10. A What are the two categories of FDMA? Compare them 6

10. B Briefly explain the sub-components of a BUS. 7

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M.SC (COMPUTER SCIENCE) PART-II

-: ELECTIVE - I:-

OPTIMIZATION TECHNIQUES &

CUSTOMER RESOURCES MANAGEMENT

(JUNE - 2018)

Q.P.Code: 10478

[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.
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Section I

1 A Solve the following using graphical Method: 6

Maximize Z= 9x+ 10y

Subject to constraints:

$11x+9y \leq 9900$

$7x+12y \leq 8400$

$6x+16y \leq 9600$

With non-negative restrictions $x, y \geq 0$.

B What are areas of application of Optimization Techniques? 6

2 A Explain the steps to solve simplex method. 6

B Solve the following using simplex method using Big M method 6

Maximize $Z=6x_1+4x_2$

Subject to constraints:

$2x_1+3x_2 \leq 30$

$3x_1+2x_2 \leq 24$

$x_1+x_2 \geq 3$

$x_1, x_2 \geq 0$

3 A Write an algorithm to explain NWCR method. 6

B Solve the following transportation problem for getting optimal solution using VAM method 6

	P	Q	R	S	Avail
A	6	5	8	5	30
B	5	11	9	7	40
C	8	9	7	13	30
Demand	35	28	32	25	

TURN OVER

4	A	What are prohibited assignments?	6
	B		6

6 wagons A, B, C, D, E, F are available at 6 stations s1, s2, s3, s4, s5, s6.
The mileages between various stations are given below.
How the wagons should be transported so as to minimize the total mileage coverage.

	S1	S2	S3	S4	S5	S6
A	30	33	28	20	26	30
B	60	30	27	26	25	21
C	70	40	50	65	18	17
D	16	17	20	30	110	19
E	28	29	38	27	70	80
F	19	20	30	40	50	65

5	A	Explain Transshipment problem.	6
	B	Write a short note on Branch and Bound algorithm to solve Integer LPP.	6

Section II

6	A	What are the benefits of CLV analysis?	6
	B	Discuss the CRM G-SPOT activity for any business with the help of a diagram.	7
7	A	What is SFA? Explain the functionality of SFA	6
	B	Explain marketing campaign and campaign management	7
8	A	Write a note on Computer Telephony Integration (CTI).	6
	B	Explain the process of customization during implementation of CRM	7
9	A	What is “Beta testing”? What are the advantages from designer’s point of view?	6
	B	Classify the call centers in brief.	7
10	A	Explain the advantages of ASP’s	6
	B	Explain the functionalities of ASP.	7