

(3 Hours)

[Total Marks : 80]

- N.B. (1) Question No. 1 is compulsory
 (2) Attempt any three out of remaining five questions
 (3) Make suitable assumptions wherever necessary and justify it.
 (4) Figures to the right indicate full marks

Q1	Write short note on following	20
	(a) Substitution method	
	(b) Dynamic programming	
	(c) Set Cover problem	
	(d) Asymptotic notation	
Q2	(a) Explain the Floyd Warshall algorithm	10
	(b) Explain Convex hull and rotational sweep also explain the Graham Scan algorithm for convex hull problem	10
Q3	(a) Write and analyze the Huffman Code algorithm and use it to Construct the Huffman code for the following characters a, b, c, d, e, f with their frequencies as given below a : 45, b : 13, c : 12, d : 16, e : 9, f:5.	10
	(b) Explain the Maximum bipartite matching	10
Q4	(a) Write a detailed note on RSA	10
	(b) What do you understand by NP Complete? Explain. Is Subset Sum problem NP complete? If so explain.	10
Q5	(a) Define approximation algorithms? Explain the travelling salesperson problem.	10
	(b) Explain Mesh algorithm in detail	10
Q6	(a) Explain the algorithm to determine whether two line segments intersects	10
	(b) Explain the Las Vegas Algorithm	10

Note :

- Solve any four questions.
- Make suitable assumptions whenever necessary.

- Q.1 [a] An autonomous university currently has 4 departments of engineering housed in one building with five floors, one floor dedicated to each branch, and a server room, office and central computing facility on the first floor. Two additional programmes viz, Pharmacy and MCA have been approved for the university, which would be housed in a separate building 1 km away. The laboratory structure of each floor in the new buildings would be similar. The university has been granted the IP address 220.57.24.0 via a 10 Mbps leased line. Design subnets so that each building is assigned a different subnet. Private IP addressing can be used for providing logical separation between the different departments. Give the design details for the backbone layer, distribution layer and access layer of the campus network. 12
- Draw the proposed network solution and include the details for IP-addressing in your design.
- Q.1 [b] Give the best practices of campus network design 08
- Q.2 [a] Explain hidden terminal problem. What are the disadvantages of the binary exponential back-off mechanism used in MACA? How are they overcome in MACAW? 10
- Q.2 [b] Enlist and explain the tasks involved in various phases of PPDIOO. 10
- Q.3 [a] What are the issues in resource reservation? Explain the various approaches of resource reservation. 10
- Q.3 [b] Explain RIP routing protocol. What is the difference between RIP v1 and RIP v2. 10
- Q.4[a] Compare and contrast IPv4 and IPv6. 10
- Q.4[b] Discuss importance of congestion avoidance mechanism. What are the various types of congestion avoidance mechanisms? Explain any two in brief. 10
- Q.5[a] Explain EIGRP routing protocol in detail. Compare it with OSPF. 10
- Q.5[b] Explain the concept of TCP congestion control mechanism. 05
- Q.5[c] Define scalability, availability and reliability. 05
- Q.6 Write short notes on the following (any two) 20
- [a] Virtualization and data centre design
 - [b] DPRMA
 - [d] High Availability Routing
 - [e] Software Defined Networking

Q.P. Code :13890

[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 3 questions from the remaining 5 questions.
 3. Draw neat diagrams wherever necessary.

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|-----|----|---|----|
| Q 1 | a) | What are the issues in load distributions? | 5 |
| | b) | What are the design issues of Network Operating Systems (NOS)? | 5 |
| | c) | What is local clock? With the help of example explain limitation of logical clock. | 5 |
| | d) | What are the distributed deadlock handling strategies? Explain. | 5 |
| Q 2 | a) | Describe two phase commit protocol of fault tolerance. | 10 |
| | b) | Explain Distributed Database System. What is the serializability condition in DDBS? | 10 |
| Q 3 | a) | Write a details notes on cloud OS. | 10 |
| | b) | Define Real Time System. Explain types of real time task with example. | 10 |
| Q 4 | a) | Write the Ho-Ramamurthy's centralize deadlock detection algorithm. | 10 |
| | b) | Explain priority inversion in RTOS. | 10 |
| Q 5 | a) | Write classification of agreement problems in Distributed system. | 10 |
| | b) | Explain Readers-writers synchronization problem in distributed operating system. | 10 |
| Q 6 | a) | What are the ways of implementing backward error recovery? Explain in detail. | 10 |
| | b) | Explain Rate Monotonic scheduling algorithm in RTOS. | 10 |
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- N.B. 1. Question No. 1 is compulsory
 2. Attempt any **three** out of remaining
 3. Assume suitable data if **necessary** and justify the assumptions
 4. Figures to the **right** indicate full marks

- Q1 A Determine the similarities and differences between MLP model with RBFN. 05
 B Show Mc-Culloch Pitt neuron to implement following data. 05
 D is a desired output. Determine Weight vector
 $W = [w_1 \ w_2]$
- | X1 | X2 | D |
|----|----|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |
- C For the fuzzy set $B = \{0.3/p + 0.8/q + 0.8/r + 0.6/s + 0/t + 0.4/u\}$ Show support, core, normality & all possible α -cut sets. 05
 D What is velocity and cognitive component in Particle Swarm Optimization? 05
- Q2 A Describe ANT colony algorithm. What kind of problems can be solved using it? 10
 B Using Hebb learning rule for the given data and initial weights, show two iteration and determine the cluster of the following new pattern: $X = [0.9 \ -0.3]$. Assume Bipolar Binary activation function and learning constant = 1.
 $X_1 = [1 \ 0.9]$, $X_2 = [0.9 \ -0.5]$, $X_3 = [-0.9 \ 1.2]$, $X_4 = [-0.9 \ -0.6]$,
 $D = [1 \ 1 \ 1 \ -1]$, $W_1 = [0.1 \ -0.1]$. 10
- Q3 A Describe Binary SVM in brief. 10
 B For the following fuzzy sets 10
 $good_service = \{1/a + 0.8/b + 0.6/c + 0.4/d + 0.2/e\}$ and
 $satisfied = \{0.2/1 + 0.4/2 + 0.6/3 + 0.8/4 + 1.0/5\}$
 Determine
 (a) Construct the relation for the rule IF x is A THEN y is B (i.e., IF x is “good_service” THEN y is “satisfied”) using the Mamdani implication.
 (b) If we introduce a new antecedent
 $Very_good_service = \{0.8/a + 0.6/b + 0.4/c + 0.0/d + 0.0/e\}$ find the new consequent B' (very satisfied), using max–min composition. 10
- Q4 A Write SDPTA algorithm and explain each step. Show clearly the stopping conditions. 10
 B Describe Binary SVM with proper example. 10

[TURN OVER]

- Q5 A Define and draw different membership functions used in Fuzzy sets. 10
 B Show with example Mutation and Crossover methods used in Genetic Algorithm. 10
- Q6 A Speed sensor reads the speed of the motor from certain controller. U for speed is SLOW, MODERATE AND FAST and the range is 0 to 1000 rpm. Define and draw these three membership functions and hence fuzzify the given input reading from the sensor 600rpm into fuzzy set Speed. 10
 B What are linearly non-separable patterns? Show with the diagram and explain how this problem can be handled? 10
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