M.E. First Semester (Digital Electronics) (Part Time / Full Time) (C.G.S.- New)

13205 : Elective-I : Computer Communication Network : 1 UMEF 3

AW - 3488

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.

1. a) List the layers of OSI model and explain the function of Application layer and transport layer. 7

b) The value of the first few bytes of a PPP frame are $7EFFC0C02109110014_{(16)}$. What is the protocol of the encapsulated payload? What type of packet is being carried? How many bytes of information are in the packet? 7

OR

2. a) Explain in detail the structure of TCP/IP model with a neat diagram and list its advantages over OSI model. 9

b) Show the contents of an echo-request packet with message "HELLO". Write whole packet in hexadecimal. Encapsulate the packet in a PPP frame and show the contents in hexadecimal. 5

3. a) What are the different extension headers used in IPv6? Explain them. 6

b) Explain multicast routing protocol. 7

OR

4. a) Draw and explain each field of IPv6 datagram. 6

b) What are the different types of query messages carried by ICMP protocol? Explain them. 7

5. a) With help of flowchart explain token bucket algorithm. List its advantages over leaky bucket algorithm. 9

b) A Bank has a single window for customer service. Customers arrives at the rate of 15 per hour. The teller at the window can serve customers at the rate of one every three minutes. Assuming Poisson arrivals and exponential service find 4
i) Average number in the waiting line.
ii) Average number in the system.
iii) Average waiting time in line.
iv) Average waiting time in the system.

OR

6. a) For M/G/1 model find the expression for mean delay. 7

b) Explain network management protocol. 6

P.T.O

7. a) A group of 'N' stations share 100 Kbps slotted ALOHA channel. Each station output a 500 bits frame on an average of 5000 ms even if previous one has not been sent. What is the required value of N? 7

b) Explain CSMA/CD and CSMA/CA technique and compare them. 7

OR

8. a) Explain CDMA technique and list its advantages. 8

b) In a CDMA/CD the data rate is 20 Mbps, the distance between station A and C is 1000 m, and the propagation speed is $2x10^8$ m/s. Station A starts sending a long frame at time $t_1 = 0$; station C starts sending a long frame at time $t_2 = 3\mu s$. The size of the frame is long enough to guarantee the detection of collision by both stations. Find: 6

i) The time when station C hearts the collision (t3)
ii) The time when station A hears the collision (t4)
iii) The number of bits station A has sent before detecting the collision.
iv) The number of bits station C has sent before detecting the collision.

9. a) Draw and explain Zigbee protocol architecture. 7

b) Explain MAC sublayer of the wireless LAN. 6

OR

10. a) What are adhoc-networks? Explain the multiple access protocol for adhoc networks. 6

b) Explain WAP architecture in detail. 7

11. a) What is cryptography? Describe public key cryptography algorithm in detail. 6

b) Using e = 13, d = 37, and n = 77 in the RSA algorithm, encrypt the message "HELLO" using the values of 00 to 25 for letters A to Z. For simplicity, do the encryption and decryption character by character. 7

OR

12. a) Explain in detail Data Encryption Standard (DES) algorithm. 7

b) What are the main threats that can rise in a network? How can you overcome them? 6

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