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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 20CS5PCCON **Max Marks: 100**
Course: Computer Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Define network. Explain the various criteria that the network must meet.	**6**
	b)	Design four sources, each creating 250 8-bit characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame calculate, (i) the data rate of each source (ii) the duration of each character in each source (iii) the frame rate (iv) the duration of each frame (v) the number of bits in each frame and (vi) the data rate of the link	**6**
	c)	Define protocol. With a neat diagram explain logical connections between layers of the TCP/IP suite	**8**

UNIT - II

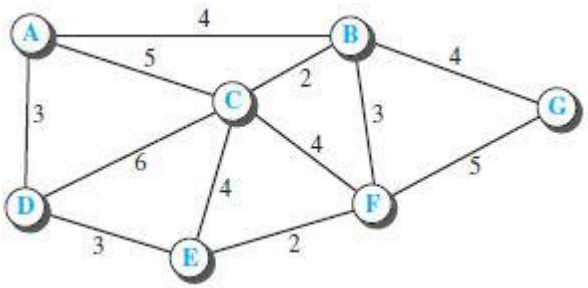
2	a)	A pure ALOHA network transmits 800-bit frames on a shared channel of 1600 kbps. What is the throughput if the system (all stations together) produces (i)1200 frames per second (ii)600 frames per second (iii)300 frames per second.	**6**
	b)	List the data link control functions. Discuss the importance of framing, with neat diagrams explain different types of framing.	**8**
	c)	Describe various implementations of Standard Ethernet.	**6**

OR

3	a)	Define Checksum. Explain the process of computing checksum at the sender and Receiver.	**6**
	b)	Illustrate with a neat diagram, the Stop-and-wait protocol's flow diagram and discuss sender and receiver states with its FSMs.	**6**
	c)	Explain the encoder and decoder logic of CRC coding with a neat diagram.	**8**

UNIT - III

4 a) Apply Dijkstra's algorithm to design the shortest path tree and the forwarding table for node A seen in the Figure **8**



b) Discuss the two approaches to route packets in the network layer with a neat diagram. **6**

c) Explain the parameters that are used to measure the performance of the network. **6**

OR

5 a) The system manager needs to configure three subnets that interconnects router: Subnet 1, Subnet 2, and Subnet 3. Suppose all of the interfaces in each of these three subnets are required to have the prefix 170.40.11.0/24. Suppose that Subnet 1 is required to support atleast 100 interfaces, Subnet 2 is to support atleast 15 interfaces, and Subnet 3 is to support atleast 60 interfaces. Design three network addresses (of the form a.b.c.d/x) that satisfy these constraints. **6**

b) An organization is granted the block 211.17.180.0/24. The administrator wants to create 32 subnets. **8**
a. Design the subnet mask.
b. Design the number of addresses in each subnet.
c. Design the first and last addresses in subnet 1.
d. Design the first and last addresses in subnet 32.

c) Discuss the general format of ICMP messages. **6**

UNIT - IV

6 a) Discuss various services provided by transport layer to application layer. **6**

b) Demonstrate TCP connection establishment with a neat diagram (three-way handshaking). **7**

c) Mention the drawbacks of Stop and wait and Go-back N protocols. Explain how Selective Repeat protocol is efficient with its working. **7**

UNIT - V

7 a) Define URL. With an example discuss the components of the URL. **6**

b) Differentiate between client server and Peer to peer paradigms. **4**

c) Illustrate with a flow diagram the working principle of FTP depicting the Connection establishment and data flow. **10**

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