Reg. No. : [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Question Paper Code : 90418

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Fifth/Sixth Semester

Computer Science and Engineering

CS 8591 – COMPUTER NETWORKS

(Common to: Computer and Communication Engineering/ Information Technology)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is the information displayed by an "ipconfig"?

2.   Among packet switch and circuit switch, which is preferred for modern digital data communication?

3.   Suppose two computers are connected by an Ethernet hub at home. Is this a LAN, a MAN, or a WAN?

4.   Describe the term "Jitter" in networks.

5.   Distinguish the routing concepts of broadcasting and unicasting.

6.   Identify the address class of the following IP addresses.

     (a)   200.58.20.165

     (b)   128.167.23.20

7.   What is the need of IPV6 addressing?

8.   What would be preferable over other (TCP/UDP),

     (a)   Streaming a live video over the internet TCP / UDP

     (b)   Large file transfers TCP / UDP

9.   How the multicasting operation done in email?

10. List out the types of DNS servers supported by the network.

PART B — (5 × 13 = 65 marks)

11. (a) Compare and Contrast the TCP/IP and OSI Reference Model with the key factors of TCP/IP Protocol suite.

Or

(b) (i) What are the different types of transmission technology? Name the different types of networks on the basis of transmission technology. Explain any one network briefly. (10)

(ii) Summarize the various factors that affect the performance of the data communication networks. (3)

12. (a) (i) Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single-bit errors? Assuming an even parity show the bit pattern transmitted for the message 1101001100110101. How the receiver does finds whether the received code word has an error or not. (8)

(ii) Elaborate the steps involved in finding CRC at both sender and receiver side. (5)

Or

(b) What is wireless communication? List out some wireless technologies available. Compare the characteristics of the various wireless 802.11 standards.

13. (a) (i) Change the following IPv4 addresses from dotted-decimal notation to binary notation. (5)

(1) 111.56.45.78

(2) 221.34.7.82

(ii) An ISP is granted a block of addresses starting with 201.101.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to two groups of customers as follows: (8)

(1) The first group has 64 customers; each customer needs 256 addresses.

(2) The second group has 128 customers; each customer needs 64 addresses.

Or

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(b) In a network, the weights are given by link-state packets and contain information such as the routers, traffic costs. Find the shortest path from node F to all others.
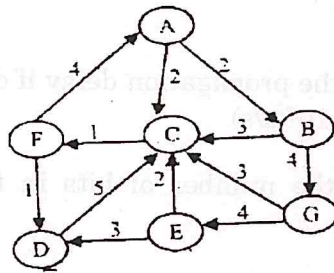
14. (a) Illustrate the TCP Connection management which reserve resources in the both communicating ends.

Or

(b) Elucidate the format of a UDP packet, also known as a user datagram, and the purpose of each header field with necessary diagram.

15. (a) Discuss the architecture of WWW and describe the concepts of hypertext and hypermedia.

Or

(b) Explain the following :

(i) HTTP (4)

(ii) SMTP (5)

(iii) SNMP (4)

PART C — (1 × 15 = 15 marks)

16. (a) (i) For each of the following four networks, discuss the consequences if a connection fails. (8)

(1) Five devices arranged in a mesh topology

(2) Five devices arranged in a star topology (not counting the hub)

(3) Five devices arranged in a bus topology

(4) Five devices arranged in a ring topology

(ii) Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 2 Mbps, and R3 = 1 Mbps. Assuming no other traffic in the network, (7)

(1) What is the throughput for the file transfer?

(2) Suppose the file is 4 million bytes roughly how long will it take to transfer the file to Host B from Host A?

Or

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(b) (i) We transmit data directly between two servers 6000 km apart through a geostationary satellite situated 10,000 km from Earth exactly between the two servers. The data enters this network at 100Mb/s. (8)

(1) Find the propagation delay if data travels at the speed of light $(2.3 \times 10^8 \text{m/s})$.

(2) Find the number of bits in transit during the propagation delay.

(3) Determine how long it takes to send 10 bytes of data and to receive 2.5 bytes of acknowledgment back.

(ii) What is your choice for the following (TCP/UDP), ignoring / annoying concerns such as firewalls that might block some protocols? Identify the valid reasons. (7)

(1) Instant messaging/email TCP / UDP

(2) Logging in to your bank website TCP / UDP

(3) Voice over IP TCP / UDP.

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