CBCS SCHEME

USN | | | | | | | | | |

18EC71

Seventh Semester B.E. Degree Examination, June/July 2024
Computer Networks

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain four fundamental characteristics on which effectiveness of data communications system depends on. **(04 Marks)**

b. Name the four basic network topologies and discuss advantages and disadvantages of each type. For 'n' devices in network, what is the number of cable links required for each topology? **(06 Marks)**

c. Write a neat diagram showing logical connections between layers of TCP/IP model of source and destination hosts. Explain responsibilities of each layer of TCP/IP model in brief. **(10 Marks)**

OR

2 a. Explain the basic principles of protocol layering that needs to be followed in network communication. **(04 Marks)**

b. With a neat diagram and example explain various modes of communication. **(06 Marks)**

c. With a neat diagram, explain the process of encapsulation and decapsulation of data in layers of TCP/IP model at source host, at router and destination host. **(10 Marks)**

Module-2

3 a. Explain the concept of bit stuffing and byte stuffing used in framing with a neat diagram clearly showing flag bytes in both the cases and also mention the importance of flag bytes. **(07 Marks)**

b. With a neat diagram, explain various field of Ethernet frame format. What are the minimum and maximum length of the frame considering the header field? **(07 Marks)**

c. Explain the 10Base-S and 10Base-T standard Ethernet implementation with all necessary details and diagram. **(06 Marks)**

OR

4 a. What are the three persistence methods used in CSMA mechanism to avoid the collisions? Explain them in detail with neat diagram. **(06 Marks)**

b. In the standard Ethernet with the transmission rate of 10 mbps, we assume that the length of the medium is 2500 m and the frame size is 512 bits. The propagation speed of a signal in a cable is 2×10^8 m/s.

(i) Calculate the efficiency of Standard Ethernet for given specification.

(ii) If length of the medium and frame size is changed to 3500 m and 1024 bits, find the efficiency. **(06 Marks)**

c. Write a neat finite state machine diagram of stop-and-wait protocol and explain various states the sender and receiver will undergo. **(08 Marks)**

Module-3

5 a. Explain in detail, various services provided by network layer. **(04 Marks)**

b. Explain various classes of IP address clearly specifying the total number of bits required for host I_D and network I_D for each class. **(06 Marks)**

c. Convert following IP addresses into dotted-decimal notation and also mention for which class the IP address belongs to,

(i) 01011110 10110000 01110101 00010101
(ii) 10001001 10001110 11010000 00110001
(iii) 01010111 10000100 00110111 00001111
(iv) 01110111 11110011 10000111 11011101 **(04 Marks)**

d. What is Network Address Translation (NAT)? Explain how NAT helps in address translation with a neat diagram. **(06 Marks)**

OR

6 a. With a neat diagram, explain datagram approach and virtual circuit approach of packet switching network. **(08 Marks)**

b. Explain various fields of IPV_4 datagram with a neat diagram. **(08 Marks)**

c. Identify the classes for which the following IP addresses belong to and also represent them in binary notation.

(i) 110.11.5.88
(ii) 12.74.16.18
(iii) 201.24.44.32
(iv) 245.34.2.8 **(04 Marks)**

Module-4

7 a. Explain connection lens and connection-oriented service showing movements of packets using timeline. **(10 Marks)**

b. Explain why the size of send window in Go-Back-N must be less than 2^n. **(06 Marks)**

c. Explain various fields of UDP header diagram. **(04 Marks)**

OR

8 a. With relevant diagrams, explain working principle Go-Back-N ARQ flow control protocol. **(10 Marks)**

b. List and explain various services provided by User Datagram Protocol (UDP). **(05 Marks)**

c. Explain the flow control and Error Control Services of transport layer in brief. **(05 Marks)**

Module-5

9 a. Explain request and response message formats of HTTP with a neat diagram. **(10 Marks)**

b. List and explain actions carried out by HTTP methods. **(04 Marks)**

c. What is File Transfer Protocol (FTP)? Explain components of client and server of FTP model with a neat diagram. **(06 Marks)**

OR

10 a. Write a neat diagram, showing various components of E-mail architecture and explain steps involved in e-mail communication between sender and receiver. **(10 Marks)**

b. What is Secure Shell (SSH)? Explain various components of Secure Shell. **(06 Marks)**

c. Bring out the key differences between TELNET and SSH. **(04 Marks)**

* * * * *