

This question paper contains 4 printed pages]

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S. No. of Question Paper : 33

Unique Paper Code : 234561

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Name of the Paper : Networks

Name of the Course : B.Sc. Mathematical Science

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Section A is compulsory.

Attempt any *five* questions from Section B.

**Section A (Compulsory)**

1. (a) Differentiate between star and bus topology. List *one* advantage and *one* disadvantage of star topology over bus topology. 2
- (b) What are the *two* approaches to packet switching ? 2
- (c) How does forward error correction differ from retransmission ? 2
- (d) Show how the following data would change when bit stuffing is applied on it : 2  
100011111100111110100011111111111000011111
- (e) Differentiate between half-duplex and full-duplex mode of data communication. 2
- (f) What do you mean when we say that a bridge can filter traffic ? Why is filtering important ? 2

P.T.O.

- (g) How does caching increase the efficiency of name resolution ? 2
- (h) Identify the layers of OSI model responsible for performing the following operations : 3
- (i) Logical Addressing
  - (ii) Synchronization of bits
  - (iii) Error Control.
- (i) Name the layers on which the following networking devices operate : 3
- (i) Bridge
  - (ii) Router
  - (iii) Gateway.
- (j) Give full form of the following acronyms : 5
- (i) TELNET
  - (ii) DNS
  - (iii) NVT
  - (iv) VPN
  - (v) WWW.

**Section B (Attempt any five)**

2. (a) What is the purpose of FTP ? Name and explain in brief the different FTP transmission modes. 5
- (b) List the advantages of optical fiber over twisted-pair and coaxial cable. 3
- (c) Define guided and unguided media. 2

3. (a) Define Virtual Circuit Network. Name and explain the three phases that a virtual circuit needs to go through. What kind of delay is involved in a virtual-circuit network ? 5
- (b) List various issues to be considered while using bridges to connect different LANs. 5
4. (a) A block of IP addresses is granted to a small organization. One of the addresses is 205.16.37.39/28. What is the first and last address in the block ? Also, find the total number of addresses. 5
- (b) What is the purpose of firewall ? Explain Packet-Filter firewall and Proxy firewall. 5
5. (a) Explain Stop-and-Wait Protocol with the help of an example. 5
- (b) In Carrier Sense Multiple Access (CSMA) which three persistence methods can be adopted when a station finds a channel busy ? 3
- (c) A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is 25.6  $\mu$ s, what is the minimum size of the frame ? 2
6. (a) Even though circuit switched network is less efficient than datagram network, delay in these networks are minimal. Explain why ? 5
- (b) What are *three* domains of the domain name space ? What is the purpose of the inverse domain ? 3
- (c) How does recursive name-address resolution differ from iterative resolution ? 2

7. Differentiate between the following (any *five*) : 5×2=10

(i) Primary Domain Name Server and Secondary Domain Name Server

(ii) Static Routing Table and Dynamic Routing Table

(iii) Repeater and Amplifier

(iv) Passive Hub and Active Hub

(v) FQDN and PQDN

(vi) Router and Bridge.

8. Write notes on any *two* of the following : 2×5=10

(i) Cookies

(ii) Radio Waves

(iii) SMTP

(iv) HTTP.