

December 2023

B.Tech (IT/CSE(AIML)) 5th Semester

Computer Network (PCC-CS-602)

Time: 3 Hours

Max. Marks:75

Instructions:

1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
2. Answer any four questions from Part -B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) Categorize four basic topologies in terms of line configuration. (1.5)
- (b) What is the difference between Network layer delivery and transport layer delivery? (1.5)
- (c) What is minimum Hamming Distance? Specify minimum Hamming distance for detection of three errors. (1.5)
- (d) A network using CSMA/CD has a bandwidth of 10 Mbps. If maximum propagation time is $25.6\mu\text{s}$, what is the minimum size of the frame? (1.5)
- (e) Why ARP is often cited as Security weakness? (1.5)
- (f) A block of address is granted to a small organization. One of the addresses is 205.16.37.39/28. What are the first address, last address and total number of addresses? (1.5)
- (g) What is the maximum and minimum size of a TCP Header and why? (1.5)
- (h) Name some of the policies that can be used to prevent congestion. (1.5)
- (i) What are the functions of two FTP Connections? (1.5)
- (j) What are Telnet Options? How they are negotiated? (1.5)

PART -B

- Q2 (a) What is TCP/IP Model, explain its layers. Also specify the data units, protocols used and communicating devices used at each layer of TCP/IP Model. (7)
- (b) Discuss advantage of Optical Fiber over twisted pair and coaxial cable. (3)
- (c) Distinguish between multilevel TDM, multiple slot TDM, and pulse-stuffed TDM. (5)
- Q3 (a) Explain the working of CSMA/CD protocol. (5)
- (b) Compare and contrast Go Back N-ARQ with selective Repeat ARQ. Why the size of sender window must be less than 2^m in Go-Back N-ARQ, where m is the size of the sequence number in bits. (10)
- Q4 (a) Compare and Contrast IPV4 and IPV6 packet formats. How can we make transition from IPV4 to IPV6. (5)

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- (b) An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP (5) wants to distribute these blocks to customers as follows.
- i. The first group has 256 medium-size businesses; each needs 16 addresses.
 - ii. The second group has 64 small businesses; each needs 8 addresses.
 - iii. The third group has 128 households; each needs 4 addresses.

Design the sub-blocks and give the slash notation for each sub-block. Find out how many addresses are still available after these allocations.

- (c) List the problems associated with Distance Vector Routing and how they can (5) be resolved?
- Q5 (a) Explain the characteristics and frame format of TCP protocol. (7)
- (b) In a connection, the value of cwnd is 3000 and the value of rwnd is 5000. The (8) host has sent 2000 bytes which has not been acknowledged. How many more bytes can be sent? Also explain the techniques used for traffic shaping.
- Q6 (a) What is HTTP? Explain its request methods and status codes (5)
- (b) Explain the protocols used for sending and receiving email (5)
- (c) Differentiate between Proxy and Packet filter Firewall (5)
- Q7 Write short note on following (any three) (15)
- i. Standard Ethernet
 - ii. Pure Aloha and Slotted Aloha
 - iii. Connectionless Protocols
 - iv. Symmetric key cryptography
