



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

B.Tech V SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 2022

Regulation: UG20

COMPUTER NETWORKS

Time: 3 Hours

COMMON to CSE | CSE (AI&ML) | CSE (DS) | CSIT

Max Marks: 70

Answer ALL questions in Module I and II
Answer ONE out of two questions in Modules III, IV and V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Outline how transmission media is used in propagating signals. Discuss the major classes of guided media in computer networks and explain each of them.
[BL: Understand| CO: 1|Marks: 7]
- (b) Suppose a 128-Kbps point-to-point link is set up between Earth and a Rover on Mars. The distance from Earth to Mars (when they are closest together) is approximately 55 Gm, and data travels over the link at the speed of light= $3 \times 10^8 m/sec$.
 - i) Calculate the minimum round trip time (RTT) for the link.
 - ii) Calculate the delay \times bandwidth product for the link.
[BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Compare pure ALOHA and slotted ALOHA. Consider the delay of both at low load. Which one is less? Justify your answer
[BL: Apply| CO: 2|Marks: 7]
- (b) A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200- kbps bandwidth. Calculate the throughput if the system (all stations together) produces
 - i) 1000 frames per second.
 - ii) 500 frames per second.
 - iii) 250 frames per second.
[BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) Demonstrate how open short path first (OSPF) protocol is used to distribute IP routing information throughout a single Autonomous System (AS) in an IP network. Explain various fields of OSPF message format with neat figure.
[BL: Understand| CO: 3|Marks: 7]
- (b) Discuss how the traffic is routed efficiently to improve speed and network performance using subnetting. The address of a class B host is to be split into subnets with a 6-bit subnet number. Calculate the maximum number of subnets and the maximum number of hosts in each subnet?
[BL: Apply| CO: 3|Marks: 7]
4. (a) Interpret the importance of quality of service in improving the network performance. Explain briefly the need of IPV4 to route the data packets . With neat figure explain IPV4 header format.
[BL: Understand| CO: 4|Marks: 7]

- (b) An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets: one subblock of 10 addresses, one subblock of 60 addresses, and one subblock of 120 addresses. Design the subblocks. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) Explain how transmission control protocol is used in controlling the entry of data packets into the network. Briefly discuss about TCP congestion control. [BL: Understand| CO: 5|Marks: 7]
- (b) Given a DUMP of a UDP header in hexadecimal format 04 21 00 0B 00 2A E2 17. Find the following:
- i) Source port number
 - ii) Destination port number
 - iii) Length of user datagram
 - iv) Length of the data [BL: Apply| CO: 5|Marks: 7]
6. (a) Summarize how user data-gram protocol (UDP) operates on top of the Internet Protocol (IP) to transmit data grams over a network. Also explain services provided by User data gram protocol. [BL: Understand| CO: 5|Marks: 7]
- (b) Suppose that the maximum transmit window size for a TCP connection is 12000 bytes. Each packet consists of 2000 bytes. At some point of time, the connection is in slow-start phase with a current transmit window of 4000 bytes. Subsequently, the transmitter receives two acknowledgments. Assume that no packets are lost and there are no time-outs. Determine the maximum possible value of the current transmit window? [BL: Apply| CO: 5|Marks: 7]

MODULE – V

7. (a) Interpret the various services provided by application layer in sending and receiving the data and meaningful information to the users. [BL: Understand| CO: 6|Marks: 7]
- (b) Identify the importance of teletype network (TELNET) through which it allows users to log into a remote host. Also identify the uses of TELNET. [BL: Understand| CO: 6|Marks: 7]
8. (a) Discuss the process of mapping the domain name with IP address? Explain the working principle of domain N system with an example. [BL: Understand| CO: 6|Marks: 7]
- (b) Explain method of transferring file from one computer to another over networks using File transport protocol (FTP) . Also explain its working with neat figure. [BL: Apply| CO: 6|Marks: 7]

