Enrollment No.: ~~...~~
Subject Code: BETCE15315
Subject Name: Computer Networks
Time: 02:30PM To 05:30PM

Date: 05/12/2025
Semester: 5
Total Marks: 100

Instructions:

1. Question No. 1 is Compulsory.
2. Make Suitable Assumptions wherever necessary.
3. Figures to the right indicate full marks.

	Marks
Q.1 (a) Define network topology. Explain any two types with diagrams.	05
(b) Explain message switching. List two advantages and two disadvantages of message switching.	05
(c) Draw diagram of OSI reference model and explain functions of each layers of OSI model.	10
Q.2 (a) Explain the architectural overview of world wide web.	05
(b) Explain HTTP in brief.	05
OR	
(b) Explain the function of network layer.	05
(c) Explain the working of e-mail protocols SMTP, IMAP and POP3 in brief with suitable diagrams.	10
OR	
(c) Discuss the DNS services in detail.	10
Q.3 (a) Explain different types of switching methods with examples.	05
(b) Explain the function of a routing table in packet forwarding.	05
(c) Explain IPv4 datagram format and importance of each field.	10
OR	
(a) List and explain the services provided by the link layer.	05
(b) Write a note on cyclic redundancy check (CRC).	05
(c) Explain the functionality of following devices: a. Hub b. Switch c. Router d. Bridge e. Gateway	10

Q.4 (a) What is ALOHA? Explain variants of ALOHA protocol. 05

(b) Consider two hosts, A and B, connected by a single link of rate R bps. Suppose that the two hosts are separated by m meters, and suppose the propagation speed along the link is s meters/sec. Host A is to send a packet of size L bits to Host B. 05

(A) Express the propagation delay, dprop in terms of m and s.

(B) Determine the transmission time of the packet, dtrans in terms of L and R

(C) Ignoring processing and queuing delays, obtain an expression for the end-to-end delay .

(D) Suppose Host A begins to transmit the packet at time t = 0. At time t = dtrans where is the last bit of the packet?

(c) Explain the architecture and working of UDP. Compare it with TCP based on reliability, overhead, and use cases. 10

OR

(a) Explain how an email is transmitted from sender to receiver. 05

(b) Explain sliding window and its role in flow control. 05

(c) Explain the working of Go-Back-N ARQ and Selective Repeat ARQ with proper timing diagrams. 10

Q.5 (a) Differentiate between multiplexing and demultiplexing in the context of transport layer. 05

(b) Explain the concept of flow control in TCP using the sliding window mechanism. 05

(c) What is the main difference between forwarding and routing? Explain at least two forwarding techniques used by the router. 10

OR

(a) Compare datagram subnet and virtual circuit subnets. 05

(b) Explain distance vector routing algorithm. 05

(c) Explain the TCP three-way handshake mechanism for connection establishment. What are the security threats? 10