



End Term (Even) Semester Examination May-June 2025

Roll no. 2294038

Name of the Program and semester: B.Tech (CSE) 6th Sem

Name of the Course: Computer Networks-1

Course Code: TCS- 604

Time: 3 hour

Maximum Marks: 100

Note:

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) Total marks for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks)

- a. Analyze the impact of propagation delay in satellite communication. What layer is affected the most and why? (CO1)
- b. A packet of 1000 bytes is sent on a 10 Mbps link with 100ms propagation delay. Calculate the total delay. (CO1)
- c. Discuss the lifecycle of an email using SMTP and POP3 or IMAP protocols. (CO2)

Q2. (2X10=20 Marks)

- a. Analyze how BitTorrent's use of parallel downloads increases performance compared to traditional FTP. (CO2)
- b. A DNS resolver queries 3 servers sequentially with RTTs of 60 ms, 30 ms, and 10 ms respectively. What is the total time to resolve the name? (CO2)
- c. Discuss why layering helps in designing complex network protocols. (CO3)

Q3. (2X10=20 Marks)

- a. Describe the role of encapsulation and decapsulation in layered protocol communication. (CO3)
- b. Given a 5-layered model, if each layer adds a 20-byte header and a message is 200 bytes, what is the total transmission size? (CO3)
- c. Compare and contrast persistent vs non-persistent HTTP. Under what circumstances is each preferred? (CO4)

Q4. (2X10=20 Marks)

- a. Analyze the working of cookies in maintaining state in stateless HTTP connections. What are the security and privacy concerns associated with them? (CO4)
- b. A network engineer is evaluating reliable data transfer protocols for different types of error-prone channels. How should they approach selecting among Stop-and-Wait, Go-Back-N, and Selective Repeat protocols based on performance, complexity, and retransmission strategy? (CO5)
- c. Describe how TCP handles connection setup and teardown with state diagrams. (CO5)

Q5. (2X10=20 Marks)

- a. Discuss how TCP implements flow control and congestion control mechanisms. (CO5)
- b. Discuss how NAT allows multiple devices to share one public IP address. (CO6)
- c. A company is allocated an IP block of 192.168.10.0/24. It needs to create 5 subnets with at least 30 hosts each. Design the subnetting scheme using CIDR and show all calculations. (CO6)