



# Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (W), Mumbai : 400058, India  
(Autonomous College of Affiliated to University of Mumbai)

## End Semester Examination

May 2023

Max. Marks: 100

Class: SY

Course Code: CE207/DS207/AI207

Name of the Course: Computer Communication and Networks

Duration: 3 hours

Semester: IV

Branch: CE/CSE

Q. No	Question	Max Marks	CO	BL
Q1a	What are the layers of the ISO/OSI protocol stack ? Summarize their functions.  OR  Compare and Contrast circuit-switched network and packet-switched network? What advantages does TDM have over FDM in a circuit-switched network?	10  10	2  2	2  4
Q1b	We want to transmit 1000 characters with each character encoded as 8 bits. a. Find the number of transmitted bits for synchronous transmission. b. Find the number of transmitted bits for asynchronous transmission. c. Find the redundancy percent in each case.	5	1	3
Q1c	Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates $R_1 = 500$ kbps, $R_2 = 2$ Mbps, and $R_3 = 1$ Mbps. a) Assuming no other traffic in the network, what is the throughput for the file transfer? b) Suppose the file is 2 million bytes. Dividing the file size by the throughput, roughly how long will it take to transfer the file to Host B? c) Repeat (a) and (b), but now with $R_2$ reduced to 100 kbps.	5	1	3
Q2a	What are the other important services in addition to translating hostnames to IP addresses provided by DNS. What are the problems with a centralized design of DNS.	10	3	2
Q2b	What are the different mechanisms used by the different reliable data transfer protocols and mention their use.	10	3	2
Q3a	What are the different scenarios in which Go-Back-N suffers from performance problems. How selective-repeat protocols avoid unnecessary retransmissions?	10	3	2
Q3b	Given below is the network topology of Gamble India Pvt. Ltd. They use OSPF routing protocol. Calculate the shortest path from node A to all nodes in the network.	10	4	3

Q4a	<p>You are a network Engineer for SPIT. The MCA department of SPIT wants to set up 7 new labs and each lab will have 20 hosts. They bought a classful address to create required subnets. One of the IP addresses from the allocated network is 192.16.30.14. As a network engineer, create subnets to minimize wastage of IP addresses. Mention Subnet ID and Subnet mask for each one of them. How many IP addresses are wasted in each subnet? How many more labs of similar requirement(20 hosts) can be accommodated in the same network?</p>	10	4	3
Q4b	<p>Assume the sender sends the dataword 1001, The divisor is 1011, During transmission the dataword is changed to 1000. Show error detection logic at sender and receiver using CRC.</p>	10	2	3
Q5a	<p>State True or False "The efficiency of Pure ALOHA is less than that of Slotted ALOHA."? Justify your answer. ALOHA protocol is used to share 56 kbps channels. If the packet is 1000 bits long, find maximum throughput for both pure and slotted ALOHA.</p>	10	2	2
Q5b	<p>Differentiate between Broadcast Routing and Multicast Routing <b>OR</b> Exemplify Network Virtualization.</p>	10	1	2