Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

End Semester Examination

May 2021

Max. Marks: 60 Duration: 2 Hrs.

Class: SE Semester: IV

Branch: Computer/Information Technology

Name of the Course: Computer Communication and Networks

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q. No.	Questions	Max. Marks	CO
1 a)	Consider Flipkart as an e-commerce site that maintains a history of purchase record for each of its customers. Describe how this can be done with cookies. Demonstrate with exchange of messages between Client and Server. OR Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Justify?	7	CO3
b)	Suppose a Sender, with a Web-based e-mail account, sends a message to the Receiver, who accesses his mail from his mail server using POP3. Discuss how the message gets from Sender's host to Receiver's host. Mention the series of application-layer protocols that are used to move the message between the two hosts.	8	CO3
2 a)	With respect to reliable data transfer(rdt) protocols, describe the need of sequence numbers in rdt2.1 and timers in rdt3.0. Demonstrate with examples.	5	CO2
b)	Identify four broad classes of services that a transport protocol can provide. For each of the service classes, indicate if either UDP or TCP (or both) provides such a service. Describe why an application developer might choose to run an application over UDP rather than TCP.	4	CO2
c)	Will a 2-way handshake always work on the network? Describe the scenarios where a two way handshake fails. Also describe the suitability of a three way handshake in the network.	6	CO3

3a)	The Company is provided with classful addresses starting from 131.120.0.0. And it wants to create autonomous systems for each department. Human Resource is the smallest department which requires 32 hosts followed by the Purchase department which wants to configure around 62 hosts. Sales require around 128 IP addresses in its department. Marketing department needs to have 128 connected devices. The Finance department will configure 96 hosts, while the Operation department will need 256 IP addresses in its network. Provide IP range and subnet mask for each department? **Rules**: i. Company assigns Initial IP addresses first keeping IP addresses at the end reserved. ii. The IP blocks which are allocated are continuous.(No gaps in ranges). iii. Make sure you assign blocks in such a way that minimum IP addresses are wasted. iv. So that unused IP addresses can bring maximum profit to ISP in future.	8	CO4
b)	Calculate checksum for an UDP segment where i. Source IP is 10.5.2.31 ii. Destination IP is 191.100.255.255 iii. The Flags of pseudo header are all set to 0's iv. Protocol Number used to identify UDP is 17 v UDP total length is 12 vi. The source port number is 5891 vii. The Destination Port Number is 4427 viii.The Message Sent is FAIL (Convert Alphabets to ASCII and then ASCII to Binary number)	7	CO3
4a)	What is the total delay (latency) for a frame of size 5 million bits that is being sent on a link with 10 routers each having a queuing time of 2 microseconds and a processing time of 1 Microseconds. The length of the link is 2000 Km. The speed of signal inside the link is 2 x 10^8 m/s. The link has a bandwidth of 5 Mbps? i. Identify individual components of delay. ii. Which component of the total delay is dominant? iii. Which component of delay is negligible?	3 1 1 1	CO1
b)	A periodic composite signal is made of four frequencies which are 5MHz, 25MHz, 35 MHz and 105 MHz. The signal power is 150 W and noise power over the channel is 10 W. The signal is represented by 8 levels. Answer following i. Find bandwidth of the signal? ii. Find SNR_{db}? iii. Find Nyquist Bit Rate? iv. Find Shannon Capacity?	4	CO1
c)	Differentiate between RIP and OSPF(10 Points) OR Differentiate between Software Defined Network and Traditional Network.(10 Points)	5	CO4