

23.11.2024(E)



Semester: July 2024 –November 2024

Maximum Marks: 100

Examination: ESE Examination

Duration: 3 Hrs.

Programme code: 01

Class: TY

Semester: V (SVU 2020)

Programme: B. Tech COMP

Institute/School/Department: K. J. Somaiya School of Engineering

Name of the department: COMP

Course Code: 16U01C502

Name of the Course: Computer Networks

Instructions: 1) Draw neat diagrams 2) All questions are compulsory

3) Assume suitable data wherever necessary

Que. No.	Question	Max. Marks
Q1	Solve any Four	20
i)	Explain Hop to hop delivery, source to destination delivery and process to process delivery with the help of an example.	5
ii)	What is the throughput of the system both in Pure ALOHA and Slotted ALOHA, if the network transmits 200 bits frames on a shared channel of 200 Kbps and the system produces 1000 frames per second?	5
iii)	A source S and destination D is connected through an intermediate router labelled as R and two switches labelled as S1 and S2. With the help of diagram determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D. Justify your answer.	5
iv)	Explain functions of Transport Layer in detail.	5
v)	Discuss Checksum calculation in Transport Layer Protocols.	5
vi)	Generate the multicast physical address from the multicast IP address 224.10.10.1. Also show how this generated physical address as destination address in an Ethernet frame is sent out on the line.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Explain working of Selective Repeat ARQ with the help of neat diagram.	5
ii)	Generate the CRC code for the message 1101010101. Given the generator polynomial $g(x) = x^4 + x^2 + 1$.	5
OR		
Q2 A	Explain working of CSMA/CA protocol with the help of Interframe spacing, Contention window and Acknowledgements. Also draw the labelled diagram.	10
Q2 B	Solve any One	10
i)	Discuss with the help of an example and diagram, the working of ARP protocol	10

	when the source and destination are on different network.	
ii)	What is the need of ICMP? Draw ICMP general header structure. List types of ICMP messages. Also Explain Redirection message and Echo request and Reply message in detail.	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Explain the open loop congestion control and closed loop congestion control policies in detail.	10
ii)	An organization has granted a block of addresses starting with 105.8.71.0/24, organization wanted to distribute this block to 11 subnets as follows: 1. First Group has 3 medium size businesses, each need 16 addresses 2. The second Group has 4 medium size businesses, each need 32 addresses. 3. The third Group has 4 households, each need 4 addresses. Design the sub blocks and give slash notation for each group and each sub-block. Find how many addresses have been left after this allocation.	10
iii)	Draw Labelled IPv4 Header Structure. A 4480 byte datagram is to be transmitted through an Ethernet with a maximum data size of 1500 bytes in frames. Let the identification field of original datagram is 465. Show the values of total length, M and D flag, identification and fragmentation offset fields in each of the fragments created out of the datagram.	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Explain in detail with the help of labelled diagram/graph various TCP Congestion control techniques in TCP.	10
ii)	Look at the 40-byte dump of an IP packet containing a TCP segment below. 45 20 03 c5 78 06 00 00 34 06 ca 1f d1 55 ad 71 c0 a8 01 7e 00 50 9a 03 3e 64 e5 58 df d0 08 b3 80 18 00 de 00 02 00 00 Identify following fields of IP and TCP header: a) IP and TCP header length (in decimal) b) Source and Destination IP address (in dotted decimal) c) Source and Destination Port Number (in decimal) d) All TCP flag values. e) Total length of IP header (in decimal)	10
iii)	Explain different types of QoS in TCP. Differentiate between Leaky bucket and Token Bucket algorithms.	10 [5+5]M

Que. No.	Question	Max. Marks
Q5	Solve any four (Short notes / Short question type)	20
i)	Write a short Note on NAT	5
ii)	Write a short note on DVMRP	5
iii)	Write a short note on TCP Timers	5
iv)	Write a short note on TELNET	5
v)	Write short note on FTP	5
vi)	IP is unreliable and best effort service. Justify	5