Total number of printed pages:02 **Programme(UG)/5th/UCSE501**

2022

Computer Network

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	What are the layers in the TCP/IP model? What is the purpose of layered architecture of computer network? Briefly explain the functions of different layers in OSI model.	2+3+10=15
	b)	What are the addressing schemes used by the application layer, transport layer, network layer and data link layer? Mention the size of the addresses.	5
2.	a)	Explain with a diagram structure of the TCP header and its various fields?	10
	b)	Why is TCP considered to be reliable and UDP unreliable protocol?	5
	c)	What is a Socket? Differentiate between host-to-host communication and hop-to-hop communication? Which layers are involved in hop-to-hop communication?	5
3.	a)	A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is 1001. i) What is the actual bit string transmitted? ii) Suppose the third bit from the left is inverted during transmission. How will receiver detect this error?	5+5=10
	b)	Explain the functioning of Go Back N protocol with an example (include diagram). How the sequence number is related to the window size in Go Back N and Selective Repeat protocol?	8+2=10
4.	a)	Define 1-persistent, Non-persistent and P-persistent CSMA.	3
	b)	Which fields in the IPv4 header are related to fragmentation?	2
	c)	Suppose a router receives an IP packet containing 600 data bytes and has to	15

forward the packet to a network with maximum transmission unit of 250 bytes. Assume that IP header is 20 bytes long. How many fragments will be created? Find the Fragment Offset, MF bit, DF bit, Total Length, Header Length of each fragment.

5. Say CIT Kokrajhar is using the network of 150.168.0.0/16. Divide it among the following subnets so that it meets the maximum number of hosts 20

Group-1:

256 subnets, each needs 128 addresses

Group-2:

1024 subnets, each requiring 4 addresses

Group-1:

128 subnets, each consisting of 16 addresses.

For each group:

i) Find the subnet mask.

ii) Find the network id.

iii) Find the broadcast address.

iv) Find the unused addresses.

6. Write short notes on any two of the following 10x2=20

a) Network Address Translation

b) Routing Protocol

c) DNS

7. a) Differentiate between Flow Control and Congestion Control. 2

b) Mention the names of any four network topologies. 2

c) What are the private IP address ranges? 3

d) Mention any four internetworking device names. 2

e) Briefly explain HTTP and SMTP protocols. 6

f) Compare Distant Vector and Link State Routing Protocols. 5

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