UPES
End Semester Examination, May 2024

Course: Computer Network
Program: MCA
Course Code: CSEG7021

Semester: IInd
Time: 03 hrs.
Max. Marks: 100

Instructions: Attempt All Questions.
Students can use the Scientific Calculator.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Discuss encoding types in the physical layer of the ISO-OSI model.	4	CO2
Q 2	A low transmission tower is used to transmit data using 3 kHz bandwidth over the link along with the 1 Watt of noise power. Calculate the data rate transmission.	4	CO2
Q 3	Calculate the total number of transmissions that are required to send 10 packets through Go Back-N with window size 3(GBN-3) and every 5th packet is lost.	4	CO1
Q 4	Which OSI layer performs the following: (i) Responsibility for delivery between adjacent nodes. (ii) Reliable process to Process transportation. (iii) Responsible for Error detection and correction.	4	CO2
Q 5	Given the IP address 180.25.21.172 and subnet mask 255.255.192.0, what is subnet/network address ?	4	CO3

SECTION B
(4Qx10M= 40 Marks)

Q 6	Sender's Data D=11010, CRC generator polynomial $= x^3 + x + 1$ apply CRC algorithm and perform calculations both at sender and receiver end.	10	CO3
Q 7	Define the relationship between transmission delay and propagation delay if the efficiency is at least 50 % in STOP and WAIT protocol.	10	CO2
Q 8	Divide the network with IP address 200.1.2.0 into 5 subnets.	10	CO4
Q 9	Describe the role of the application layer and session layer of the OSI model in detail. <center>OR</center> Explain CSMA/CD in detail	10	CO4 CO2

	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	1. Describe ARP and RARP with examples and give the differences. 2. Illustrate the important features of UDP. Why is it not considered as reliable service? 3. Explain the distance vector routing algorithm with a suitable example. And contrast it with the link-state routing protocol. 4. An IP datagram of size 1000 bytes arrives at a router. The router has to forward this packet on a link whose MTU (maximum transmission unit) is 100 bytes. Assume that the size of the IP header is 20 bytes. The number of fragments that the IP datagram will be divided into for transmission is	**20(5+5+5+5)**	**CO4** **CO2** **CO1** **CO3**

Q 11	Write Short notes on any four of the following:
	   i. Slotted ALOHA
	   ii. IPv4 Header
	   iii. E-Mail
	   iv. Token Ring
	   v. Guided Media
	   vi. DNS in the Internet
		20(5+5+5+5)	**CO2**

	OR 1) Classless Inter-domain Routing (CIDR) receives a packet with address 131.23.151.76. The router's routing table has the following entries: <table><tr><th>Prefix</th><th>Output Interface Identifier</th></tr><tr><td>131.16.0.0/12</td><td>3</td></tr><tr><td>131.28.0.0/14</td><td>5</td></tr><tr><td>131.19.0.0/16</td><td>2</td></tr><tr><td>131.22.0.0/15</td><td>1</td></tr></table> **Table 1** The identifier of the output interface on which this packet will be forwarded is _____ 2) What are the reasons for congestion in a network? Describe any one method for congestion control.	**20(10+10)**	**CO3**