DEPARTMENT OF DATA SCIENCE

UNIT TEST-I

Class: TE **Semester: V** **Subject: CN**

Date: 26/10/2023 **Time: 10.30am-12.00pm** **Max marks: 40**

Note the following instructions

1. **Attempt all questions.**
2. **Draw neat diagrams wherever necessary.**
3. **Write everything in Black ink (no pencil) only.**
4. **Assume data, if missing, with justification.**

Q.N	Questions	MARKS	CO	Blooms Taxonomy Level	PO
Q.1.	**Attempt any two.**				
a)	Compare and contrast ISO/OSI and TCP/IP reference models.	[5]	CO1	L2	
b)	Describe different types of networks.	[5]	CO1	L2	
c)	Explain repeater, hub, bridge, switch, gateway.	[5]	CO1	L2	
d)	Classify transmission media and compare them.	[5]	CO1	L2	

Q.2.	**Attempt any two**				
a)	Classify different framing methods and solve the below: The following character encoding is used in a data link protocol: A: 11010101; B: 10101001; FLAG: 01111110; ESC: 10100011 Show the bit sequence transmitted (in binary) for the five-character frame: A ESC B ESC	[10]	CO2	L3	PO2, PO3, PO5

	FLAG when each of the following framing methods are used: (a) Flag bytes with byte stuffing. (b) Starting and ending flag bytes, with bit stuffing.				
b)	Summarise multiple access protocols. Choose a pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. Calculate the throughput if the system (all stations together) produces a. 1000 frames per second b. 500 frames per second c. 250 frames per second.	[10]	CO2	L3	PO2, PO3, PO5
c)	Determine the purpose of error control and solve the below: A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x4+x+1. What is the actual bit string transmitted?	[10]	CO2	L3	PO2, PO3, PO5
Q.3.	**Attempt any one.**				
a)	Demonstrate the procedure of fragmentation in IPV4 with example and solve the questions below: i. In an IP packet, the value of HLEN is 1000 in binary. How many bytes of options are being carried by this packet? ii. A packet has arrived with an M bit value of 1 and a fragmentation offset value of zero. Is this the first fragment, the last fragment, or a middle fragment? Justify your answer.	[10]	CO3	L3	PO2, PO3, PO5
b)	Examine the differences between IPV4 and IPV6 addressing. i. What is the valid most compressed format possible of the IPv6 address 2001:0DB8:0000:AB00:0000:0000:0000:1234? ii. 2001:0000:0000:abcd:0000:0000:0000:0001? iii. 47CD:0000:0000:0000:0000:0000:A456:0124?	[10]	CO3	L3	PO2, PO3, PO5
