Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VI SEMESTER B. Tech DEGREE END SEMESTER EXAMINATION MAY 2023

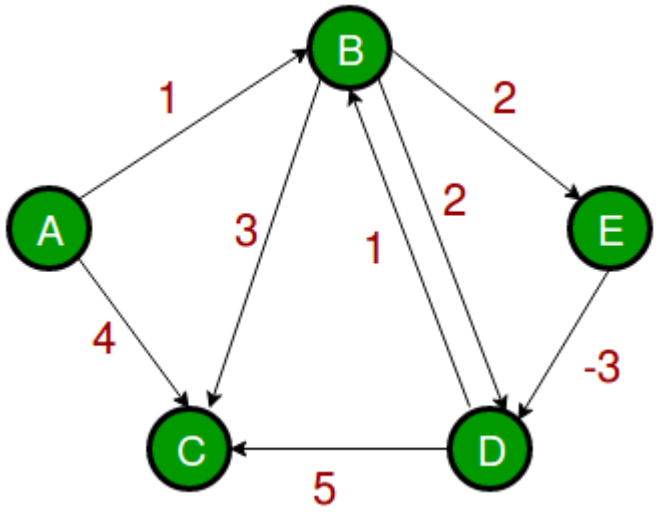
SUBJECT: COMMUNICATION NETWORKS (ECE 3251)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

Q. No.	Questions	M*	C*	A*	B*
1A.	Three channels, one with a bit rate of 100 kbps, one with a bit rate of 200 kbps and another with a bit rate of 300 kbps, are to be multiplexed. Explain how this can be achieved? Determine the frame rate, frame duration, bit rate of the link?	4	1	1	3
1B.	Seven channels, each with a 200-kHz bandwidth, are to be multiplexed together. Determine the minimum bandwidth of the link if there is a need for a guard band of 20 kHz between the channels to prevent interference? Explain the method to be followed, if we intend to transmit the above signal with the speed 3* 10^8? Explain with the help of a neat diagram.	3	1	1	3
1C.	A bit stream 1101011011 is transmitted using CRC method and the generator polynomial is G(x) = x^4 + x + 1. Determine the actual bit string transmitted and what will be the inference if 1101011011 is received at the receiver?	3	1	1	4
2A.	Explain why and which CSMA scheme is using jamming signal. Given that the above-mentioned scheme is used in a network that has a bandwidth of 20 Mbps. If the maximum propagation time is 25.6 μs, determine the minimum size of the frame?	4	2	2,3	3
2B.	With the help of diagrams, explain various persistence strategies in Media Access Control.	3	2	2,3	3
2C.	Explain the use of monitor bit in token ring with necessary diagram.	3	2	2,3	3
3A.	Using appropriate algorithm, find the shortest path from node A to other nodes in the following figure. Explain the reason for choosing the algorithm.	4	3	2,3	3

					
3B.	Describe how count to infinity problem degrades performance of distance vector routing.	4	3	2,3	3
3C.	A large number of consecutive IP address are available starting at 172.16.0.0. Suppose that four organizations, A, B, C, and D, request 2000, 4000, 6000, and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation.	2	3	14, 15	3
4A.	Identify and explain the components of the following IPv4 header. <table><tr><td>4</td><td>5</td><td>0</td><td colspan="2">28</td></tr><tr><td colspan="3">49.153</td><td>0</td><td>0</td></tr><tr><td>4</td><td colspan="2">17</td><td colspan="2">0</td></tr><tr><td colspan="5">10.12.14.5</td></tr><tr><td colspan="5">12.6.7.9</td></tr></table>	4	3	2	3
4B	Explain Silly Window Syndrome? Propose the solutions to resolve Silly Window Syndrome at the transmitter and receiver.	3	4	2	3
4C	Explain DNS maps the Domain names to an IP address? Mention the steps.	3	5	2	3
5A.	Why FTP is essential in file transfer between client and server? Explain the functioning of the FTP in detail with relevant diagrams.	4	5	1	3
5B.	With suitable diagrams, discuss the functioning of MTA in delivering Emails.	3	5	1	3
5C.	Explain the steps of 3-way and 4-way handshaking in TCP with suitable examples.	3	4	1	3

M*--Marks, C*--CLO, A*--AHEP LO, B* Blooms Taxonomy Level