Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

SIXTH SEMESTER BTECH. (E & C) DEGREE END SEMESTER EXAMINATION
AUGUST 2021
SUBJECT: COMMUNICATION NETWORKS (ECE - 3251)

TIME: 2 HOURS **MAX. MARKS: 40**

Instructions to candidates
- Answer **Any FOUR full** questions.
- Missing data may be suitably assumed.

1A. Draw the ATM Reference model. Mention the functions of each layer in comparison with ISO: OSI model.

1B. Explain the features of various packet switching techniques with necessary diagrams. Also mention their advantages and disadvantages.

(5 + 5)

2A. We have four sources, each creating 250 characters/sec. If the interleaved unit is a character and 1-bit is used for frame level synchronization, find the:

i. Data rate of each source
ii. Duration of each character at each source
iii. Frame rate
iv. Frame duration
v. Number of bits per frame
vi. Data rate of the link.

2B. Calculate the checksum for the following IPv4 packet.

0x4	0x5	0x00	44_{10}	
9D08			010_2	0000000000000_2
128_{10}		0x06	8BFF	
128.143.137.144				
128.143.71.21				

(5 + 5)

3A. Manipal Academy of Higher Education (MAHE) is granted with a block of addresses and one of the addresses is 160.124.228.200/19. MAHE needs to allocate these addresses to its three Institutes MIT, KMC, MCODS as follows:

i. MIT has 24 departments and each department needs 115 addresses
ii. KMC has 20 departments and each department needs 56 addresses
iii. MCODS has 10 departments and each needs 28 addresses.

Design the subblocks for each institute and mention the range of addresses still available after these allocations.

3B. Derive the link utilization of Stop-and-Wait Protocol for a noiseless link, also for a noisy link.

(5 + 5)

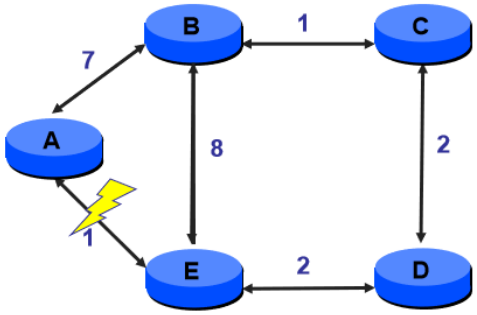
4A. If 2-bits are used to represent frames, then what should be the maximum window sizes of sender and receiver in Selective Repeat ARQ, Go-Back-N ARQ? Justify your answer by illustrating the frame transmissions with suitable examples.

4B. Find the channel utilization for the following links using Stop-and-Wait protocol and draw the conclusions.

(5 + 5)

5A. What is Silly Window Syndrome? Propose the solutions to resolve Silly Window Syndrome at the transmitter and receiver.

5B. Form the routing table at node 'A' before and after the link breaks between nodes 'A' and 'E'. Using Bellman-Ford Routing Algorithm.



(5 + 5)

6A. How DNS maps the Domain names to an IP address? Mention the steps.

6B. Draw the TCP segment header format and mention the details of each field.

(5 + 5)