Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

FIFTH SEMESTER B.TECH. (E & C) DEGREE END SEMESTER EXAMINATION
DECEMBER 2018/JANUARY 2019
SUBJECT: COMMUNICATION NETWORKS (ECE - 3105)

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

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

1A. Draw the ATM reference model and explain the functions of each layer in detail.

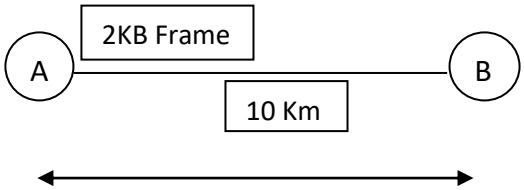
1B. We have four sources, each creating 250 characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame, find:
(i) the data rate of each source (ii) the duration of each character in each source
(iii) the frame rate (iv) the duration of each frame
(v) the number of bits in each frame (vi) the data rate of the link.

1C. We would like to use "CAT6" twisted-pair cable to transmit information at a bit rate of 1.2Gbps. Is a SNR of 30dB is enough to reliably transmit this much information? Why or why not?

(4 + 3 + 3)

2A. Explain the various switching techniques with necessary diagrams.

2B. Find the channel utilization of the following link that uses Stop-and-Wait ARQ Protocol if the data rate is equal to 100Mbps.



2C. For a given 8-bit data word 11010100, form the Hamming Codeword.

(4 + 3 + 3)

3A. Draw the format of IEEE802.5 frame format and explain each field in detail.

3B. Ten thousand airline reservation stations are competing for the use of a single slotted ALOHA channel with slot time of 125μsec. On average, each station makes 18 requests/hour. What is the approximate total channel load?

3C. If the IPv4 packet header is: 01 A0 F2 03 F4 F5 F6 F7 00 00 (00 00 is the checksum to be calculated), find the Checksum.

(4 + 3 + 3)

4A. MU is granted a block of addresses with the beginning address 14.24.74.0/24. MU needs to have 3 subblocks of addresses to use in its three Institutes (MIT, KMC, SOIS) as follows: 1st subblock of 120 addresses, 2nd subblock of 60 addresses, and 3rd subblock of 10 addresses. Design the subblocks and find the range of addresses that are still available after these allocations.

4B. For a 10Base5 cable:

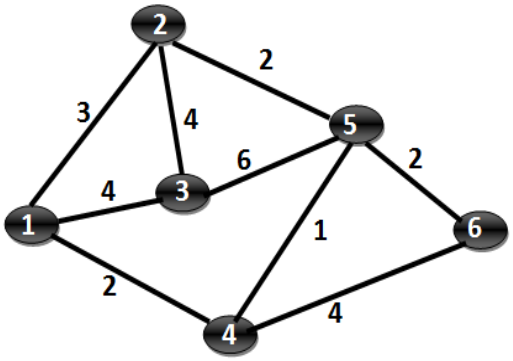
a) How long does it take for a bit to travel from the beginning to the end of the network? Ignore any propagation delay in the equipment.

b) find the maximum time it takes for a sender to detect a collision.

c) find the minimum size of an Ethernet frame for collision detection

d) Find the bit length in the medium.

4C. Use Dijkstra's algorithm to find the cost of the cheapest path between node '1' and node '6' in the following weighted graph. [Note: Mention the routing updates in the form of table]



(4 + 3 + 3)

5A. What are the client and server components in FTP? Also mention the different connections and their features in FTP.

5B. What is Silly Window Syndrome? Propose any Three techniques to resolve it.

5C. Mention the TCP Timers and explain each.

(4 + 3 + 3)