Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester VII - 2020

Course Code : ECE3108

Course Name : Sem VII - ECE3108 - Data Communication and Computer Networks

Program : B. TECH

Date : 2-NOV-2023

Time : 11:30AM -1:00PM

Max Marks : 60

Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. Transmission mode, also known as a communication mode, is the transfer of data between two devices via a communication channel that includes an optical fibre, wireless channels, copper wires, etc. What are different transmission modes in data communications?

(CO1) [Knowledge]

2. The application layer is primarily responsible for setting up a model to identify communication methods to allow users and hosts to interact with the software applications available on the internet. Name some protocols used in application layer of TCP/IP network model?

(CO1) [Knowledge]

3. The channelization protocol allows numerous stations to access the same channel at the same time by sharing the link's resources. What are different channelization protocols?

(CO2) [Knowledge]

4. Data Link Control is the service provided by the Data Link Layer to provide reliable data transfer over the physical medium. Define flow control?

(CO2) [Knowledge]

5. Time Division Multiple Access (TDMA) is a digital modulation technique used in digital cellular telephone and mobile radio communication. What is the main problem in TDMA?

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(4 X 5 = 20M)**

6. To improve the efficiency of transmission, multiple frames must be sent in transition while waiting for acknowledgement. Identify the error control protocol of the data link layer in which the receiver window size is fixed to one and the sender sends several frames before receiving the acknowledgement. Explain the same with the flow diagram assuming that no data is lost but some acknowledgements are delayed and one is lost.

(CO2) [Comprehension]

7. In a particular scenario assume that channel between sender and receiver is completely free from errors but there may be problems of delay and flow so the receiver should make the sender wait. Identify the most suitable protocol from datalink layer and explain it in detail?

(CO2) [Comprehension]

8. In a certain data communication network, transmitting station has the data frame in which the receiver address is the address of the immediate neighbouring station, and not the end destination station. Which layer of OSI model is used for representing the above data? Explain the characteristics and tasks of this layer?

(CO1) [Comprehension]

9. In a certain data communication network, transmitting station has the packets in which the receiver address is the address of the destination station. Which layer of OSI model is used for representing the above data? Explain the characteristics and jobs of this layer in detail?

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 15 = 30M)**

10. 10 A)

Slotted aloha network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all station together) produces?

1. 1000 frames per second
2. 500 frames per second
3. 250 frames per second

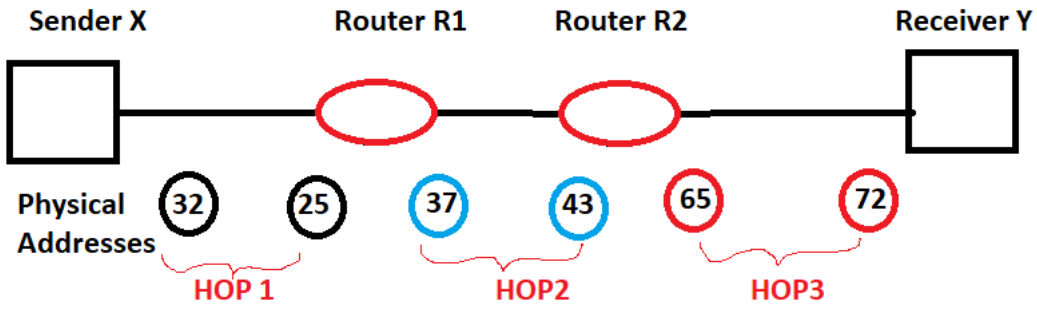
B)

In the Controlled access technique, all stations need to consult with one another in order to find out which station has the right to send the data. The controlled access protocols mainly grant permission to send only one node at a time; thus in order to avoid the collisions among the shared mediums. Explain about polling access method?

(CO2) [Application]

11. A)

Let a route between Sender with NL address "X" and Receiver NL address "Y" be going through 2 routers, R1 and R2. As we know, at DLL, only the MAC Layer gets encapsulated and de-capsulated at each router, while the logical addresses of NL gets encapsulated and de-capsulated only at the End Machines. Let the route be shown as follows. Show Encapsulation and de-encapsulation at all stages.



B)

We know that framing can be done by various methods, and in a given situation we are using bit stuffing scheme for framing. Let Flag Sequence be 6 continuous 1s (0111 1110). If the data given by the NL at the sender to the DLL is as follows

(a) 10010011 11000111 11100101 10000001 10100110 01111110 10111111

(b) 10110011 01111110 01111110 11100111 11100101 10000001 10100110 10111111 10000001

Show both BIT stuffing at sender and De-stuffing at the receiver. (CO1) [Application]