

Roll No.

MCA/M09
Computer Networks and Data Communication
Paper: MCA-202

6240

Time : Three Hours

[Maximum Marks : 80]

Note :- Attempt **Five** questions in all. Question No. **1** is compulsory and is of 24 marks. In addition to the compulsory question, attempt four more questions selecting **One** from each unit. All question of Unit-I, **II**, **III** and **IV** are of **14** marks each.

1. Answer the following in brief :-

- (a) What are the services provided by the Internet?
- (b) List the features of ATM.
- (c) What will be the maximum data rate for a 6 MHz wide noiseless channel where four-level digital signals are sent?
- (d) Sketch the Manchester and differential Manchester encoding for the bit stream 100111010.
- (e) A bit string , 011110111110111110 , need to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?
- (f) When and how is binary exponential backoff algorithm used?
- (g) What is flooding?
- (h) How does optimality principle affect routing?

UNIT-I

- 2. What is a computer network? Categories networks on the basis of scale and transmission technology describing the design issue related to each category.
- 3. Sketch the layer of OSI reference model and explain the function of each of its layers. Compare OSI model with TCP/IP model highlight the important protocols of the TCP/IP model.

UNIT-II

- 4. Distinguish between the following :-
 - (a) Frequency modulation and quadrature amplitude modulation
 - (b) FDM and TDM
 - (c) Bit rate and baud rate.
- 5. (a) What is the role of switching in data communication? Describe the major switching techniques used for voice data communication.
 - (b) What are the characteristics and applications of twisted pair and optical fibers?

UNIT-III

- 6 (a) What are the advantages of selective repeat sliding window protocol over go back n sliding window protocol?
- (b) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $X^3 + 1$. Show the actual bit stream transmitted.
- 7 (a) What action is taken by a station using Aloha protocol when a collision occurs? How does slotted Aloha work?
- (b) How is media access controlled in the wavelength division multiple access protocol?

UNIT-IV

- 8 (a) Distinguish between the virtual circuit and datagram services of the network layer.
- (b) How is the shortest route computed using Dijkstra's algorithm?
- 9 (a) Explain the concept of routing and congestion control in the network layer.
- (b) Describe one algorithm each for routing and for congestion control of your choice.