Code: D-21 / DC-11 **Subject: DATA COMMUNICATION & NETWORKS**
Time: 3 Hours **Max. Marks: 100**

NOTE: There are 11 Questions in all.

- **Question 1 is compulsory and carries 16 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
- **Answer any THREE Questions each from Part I and Part II. Each of these questions carries 14 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or best alternative in the following: (2x8)

a. When data and acknowledgement are sent on the same frame, this is called _____.

(A) Back packing. **(B)** Piggy packing.
(C) Piggy backing. **(D)** none of the above.

b. B-PSK usually requires _____ FSK for the same data rate.

(A) more bandwidth than **(B)** less bandwidth than
(C) same bandwidth as **(D)** an order of magnitude more bandwidth than

c. Uni-polar, bi-polar and polar encoding are examples of _____ modulation.

(A) digital-to-analog **(B)** digital-to-digital
(C) analog-to-digital **(D)** analog-to-analog

d. Decryption and encryption of data are the responsibility of the _____ layer.

(A) physical **(B)** data link
(C) presentation **(D)** session

e. Virtual circuit switching is a form of

(A) Datagram switching. **(B)** Message switching.
(C) Packet switching. **(D)** Circuit switching.

f. X.25 provides data link control using one of the following bit oriented protocol

(A) LAP **(B)** LAP B
(C) LAP C **(D)** HDLC

g. A protocol that is concerned with file transfer, management, and access is _____.

(A) MHS. **(B)** FTAM.
(C) DS. **(D)** CMIP.

h. In which OSI layer does the FDDI protocol operate.

(A) physical **(B)** data link
(C) network **(D)** **(A)** and **(B)**

PART I
Answer any THREE Questions. Each question carries 14 marks.

Q.2 a. Why are standards important in data communication? Discuss attributes of a good standard. **(6)**

b. With a neat block diagram give the architecture of data communication path and explain the relevance of modems. **(8)**

Q.3 a. With neat diagrams give an account of OSI layering with emphasis on the transport layer and its services to above layers. **(7)**

b. Compare various transmission media (both wired and wireless). **(7)**

Q.4 a. Write a note on error detection and correction methods. **(7)**

b. With neat diagrams discuss TCP segment format and IP data gram. **(7)**

Q.5 a. What is ISDN? Explain the data link protocols used in ISDN. **(6)**

b. Compare the mechanism of a space division switch to the mechanism of a time division switch. Compare a TSI to a TDM bus. **(8)**

Q.6 a. Describe the line configuration, transmission mode, flow and error control methods used in BSC transmission. **(9)**

b. Name and discuss briefly the bits in the HDLC control field. **(5)**

PART II
Answer any THREE Questions. Each question carries 14 marks.

Q.7 a. What is routing? Discuss distance vector routing with the help of a subnet topology. Discuss what are different matrices used in the algorithm. **(7)**

b. Explain the terms TDM, STDM. Discuss methods used for Frame synchronization. **(7)**

Q.8 a. Compare the sliding window protocol of data link layer and transport layer. **(7)**

b. Discuss the short comings of transmission of data through telephone lines. How this problem is solved using optical fibers. **(7)**

Q.9 a. Explain QPSK system by means of a block diagram. Explain its operation and draw the constellation diagram. **(7)**

b. For a QPSK modulator construct the truth table for inputs Q=0 and I=0. **(7)**

Q.10 a. Discuss the concept of line configurations and various transmission modes used in data communication. **(5)**

b. What is LCU? Draw the block diagram of UART transmitter and explain its operation. Discuss the concept of line configurations and various transmission modes used in data communication. **(9)**

Q.11 Answer the following in brief:

(i) Describe the format of ATM cell. **(5)**
(ii) Advantages of frame relay over X.25. **(4)**
(iii) Mobile IP protocols. **(5)**