(i) Printed Pages: 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 8712

Exam. Code : 1219

PGDCA 1st Semester

(2123)

DATA COMMUNICATIONS AND NETWORKS

Paper : PGD–1104

Time Allowed : Three Hours] [Maximum Marks : 60

Note :—Attempt **five** questions in all including Question No. **1** in Section A, which is compulsory and taking **one** each from Section B to Section E.

SECTION—A

(Compulsory Question)

1. (a) Differentiate between Routers and Gateways on the basis of layer, ports, device type and speed.

   (b) Give two examples of application layer protocols and their port numbers.

   (c) What is High Level Data Link Protocol ? Explain.

   (d) Elaborate Tunneling technique of internetworking.

   3,3,3,3

SECTION—B

2. Name the seven layers defined in the ISO OSI Reference Model and state the functions of the lowest three layers. How is TCP/IP model different from OSI model ? 12

3. Classify computer networks on the basis of geographical span and explain. Use diagrams wherever appropriate. 12

SECTION—C

4. Clarify the key difference(s) between "circuit-switched" and "packet-switched" networks. Discuss the different approaches to circuit switching. Why it is suitable for voice Transmission ? What are its limitations ? 12

5. What is guided and unguided transmission media in computer networks ? Give two examples of each. What are the advantages and disadvantages of each ? 12

SECTION—D

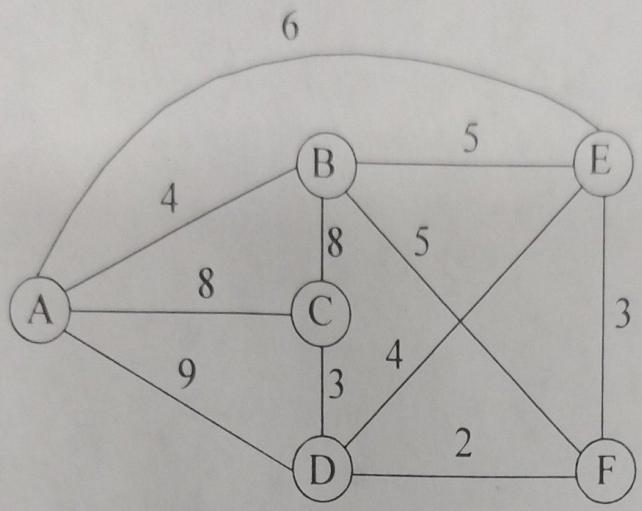
6. (a) Given a 10 bit sequence frame : 100101001 and a divisor (polynomial) of 10011, find the CRC.

   (b) What is hamming distance ? An 8-bit byte with binary value 10101111 is to be encoded using an even-parity Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single bit errors ? 6,6

7. Name and describe two types of frame errors that occur in the transmission of frames. In the sliding windows method of flow control, several frames can be transit at a time. Explain the working of one-bit sliding window protocol. 12

SECTION—E

8. Formulate the shortest path problem in a computer network. Write and apply Dijkstra's Shortest path algorithm to find the shortest path from a source node A to all the other nodes in a graph given below :



12

9. Differentiate between the following :

   (a) Leaky Bucket Traffic Shaper and Token Bucket Traffic Shaper.

   (b) Distance vector routing and Link state routing. 6,6