24225

3 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions –   (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any FIVE of the following :**   **10**

a) Enlist four basic characteristics for efficient data communication system.

b) The bit rate of a signal is 2000. If each signal element carries five bits. What is the baud rate?

c) State four disadvantages of line of sight Transmission (LOS) with respect to Data Communication.

d) Define Forward Error Correction (FEC) Technique with neat labelled diagram/sketch.

e) Draw the neat sketch with labels layered Architecture of seven layers of OSI/ISO reference model for Data communication.

f) Enlist four key FTP standardized commands to facilitate communication between client and server.

g) State four requirements of Network computing Model to share resources and information.

P.T.O.

Marks

2. **Attempt any THREE of the following :** **12**

    a) Give difference between Analog Signal and Digital Signal with respect to terms.

        i)   Representation/Diagram

        ii)   Bandwidth

        iii) Data Storage

        iv) Application/uses

    b) Draw and explain bluetooth architecture of piconet.

    c) Explain the working of ppp (point to point) protocol.

    d) State the functions of Internet Protocol (IP) considering below mention functions.

        i)   Logical Addressing

        ii)   Packet Routing

        iii) Fragmentation

        iv) Decapsulation

3. **Attempt any THREE of the following :** **12**

    a) Explain the terms related to Bandwidth in Data communication and networking.

        i)   Amplitude with diagram and units used to measure amplitude.

        ii)   Frequency with diagram and units used to measure frequency.

        iii) Wavelength with diagram and formula used to calculate wavelength.

        iv) Phase with diagram and units used to measure phase.

    b) Explain the Richard W. Hamming Error detection code for Error present in the received data and Error correction code for the Error present in the received data.

Marks

   c) Explain three server methods of Dynamic Host Configuration Protocol (DHCP) of TCP/IP network model for allocating IP – addresses.
State two features of DHCP (Dynamic Host Configuration Protocol).

   d) Explain the following methods of switches for OSI network model

      i)   store – and – forward switching

      ii) cut – through switching

4.   **Attempt any THREE of the following :**   **12**

   a) Explain Full Duplex Communication Mode with neat labelled diagram for Data Communication.

      State two advantages of Full Duplex Communication.

      State two disadvantages of Full Duplex Communication.

   b) Explain the working of satellite communication system in detail with signal uplink and signal downlink along with neat labelled diagram.

   c) Explain two types of Error in Data transmission with example.

      i)   Single – bit Error

      ii) Burst Error

   d) Explain the structure of IPV6 Address in detail.

   e) Explain two functions of following layer of OSI/ISO Model used for

      i)   Session layer

      ii) Presentation layer

Marks

5. **Attempt any TWO of the following :** 12

   a) Explain the following types of network with neat label diagram.

      i) LAN

      ii) MAN

      iii) WAN

   b) Explain three phases of connection oriented packet switching with neat labelled sketch.

      State two advantages of packet switching.

      State two disadvantages of packet switching.

   c) Explain the working of TCP and UDP protocol in the TCP/IP network model with neat labelled diagram.

      State any two advantages of TCP and UDP protocol.

6. **Attempt any TWO of the following :** 12

   a) Define Time Division Multiplexing (TPM) Explain two types of Time Division Multiplexing with neat sketch.
State two applications of TDM.

   b) Explain three types of ARQ (Automatic Repeat Request) error correction technique for data transmission with neat sketch.

   c) State difference between
Peer – to – peer computing model and client – server computing model considering below functions (any six)

      i) Type of computing model

      ii) Type of service

      iii) Resource sharing

      iv) Security

      v) Performance

      vi) Reliable

      vii) Communication type

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