Total No. of Questions : 12]

SEAT No. :

P648

[Total No. of Pages : 3

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S.E. (Information Technology) (Semester - II)
DATA COMMUNICATIONS
(2008 Course)

Time : 3 Hours]   *[Max. Marks :100*

Instructions to the candidates:

1) *Answer Question 1 or 2, 3 or 4, 5 or 6 from Section - I and Question 7 or 8, 9 or 10, 11 or 12 from Section - II.*

2) *Answers to the two sections should be written in separate answer books.*

3) *Neat diagrams must be drawn wherever necessary.*

4) *Figures to the right indicate full marks.*

5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Draw ISO - OSI reference model. What are the responsibilities of   **[8]**
    i)   Physical layer
    ii)   Data Link layer
    iii) Network layer

   b) Explain the various transmission impairments in data communications.
                                                                              [8]

OR

Q2) a) What is serial transmission? Explain synchronous and asynchronous transmission.   **[8]**

   b) Distinguish between   **[8]**
    i)   Base band transmission and Broad band transmission
    ii)   Time Domain and Frequency Domain

Q3) a) Explain the following shift keying techniques with suitable diagram. **[8]**
    i)   ASK   ii)   FSK
    iii) PSK   iv)   QAM

   b) Explain BPSK and QAM. Draw constellation diagram of it.   **[8]**

OR

P.T.O.

Q4) a) Draw a neat waveform for amplitude modulation **[8]**

        i)   Modulating signal

        ii)   Carrier signal

        iii)   Amplitude modulated signal

        iv)   Frequency spectrum of AM wave

    b) Explain the concept of multiplexing. Explain TDM , FDM and WDM. **[8]**

Q5) a) Explain Circuit Switched network with all three phases. State advantages and disadvantages. Discuss about the efficiency and delay in a circuit switched network. **[10]**

    b) Draw an electromagnetic spectrum for wireless communication. Explain Ground wave, Sky wave and Space wave propagation. **[8]**

OR

Q6) Write short note on : **[18]**

    a) Structure of Circuit Switches.

    b) Unguided Media

    c) Virtual Circuit network.

SECTION - II

Q7) a) What is CRC? Generate the CRC code for message 1001101010.Given generator Polynomial $g(x) = x^4 + x^2 + 1$. **[8]**

    b) Explain stop and wait ARQ, GO Back-n ARQ and selective repeat ARQ. Comment on the performance of each. **[8]**

OR

Q8) a) Explain various Station types and configurations used in HDLC. **[8]**

    b) Explain error detection and error correction in block coding. **[8]**

Q9) a) Discuss CSMA/CD Random Access techniques. How is collision avoidance achieved in the same? **[8]**

    b) Discuss the medium access control technique used in Token Ring network with suitable example. **[8]**

OR

*Q10)*a) Explain FDMA, TDMA & CDMA in details. **[8]**

b) Discuss Gigabit Ethernet with reference to the following : **[8]**

    i) MAC Sub Layer

    ii) Gigabit Ethernet Frames

    iii) 1000 BaseX specification

*Q11)*Write short notes on :

a) Virtual LAN. **[6]**

b) Working of Switch and Router **[6]**

c) SONET Devices. **[6]**

<div align="center">OR</div>

*Q12)*Write short notes on:

a) Connecting Devices. **[6]**

b) SONET Layers. **[6]**

c) Two-layer & three-layer switches. **[6]**

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