

Total No. of Questions : 12]

SEAT No. :

P648

[Total No. of Pages : 3

[4457] - 126

**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]

OR

**Q12)** Write short notes on:

- a) Connecting Devices. [6]  
b) SONET Layers. [6]  
c) Two-layer & three-layer switches. [6]

