

May - June - 2011

Total No. of Questions—12]

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**[3962]-216**

**S.E. (Information Technology) (II Sem.) EXAMINATION, 2011**

**DATA COMMUNICATIONS**

**(2008 PATTERN)**

**Time : Three Hours**

**Maximum Marks : 100**

- N.B. :—**
- (i) Answer Questions 1 or 2, 3 or 4, 5 or 6 from Section I and Questions 7 or 8, 9 or 10, 11 or 12 from Section II.
  - (ii) Answers to the two sections should be written in separate answer-books.
  - (iii) Neat diagrams must be drawn wherever necessary.
  - (iv) Figures to the right indicate full marks.
  - (v) Assume suitable data, if necessary.

**SECTION I**

1. (a) Explain ISO-OSI reference model in detail. [8]
- (b) State and explain Shannon's channel capacity theorem. [4]
- (c) What are the advantages of digital signals over analog signals ? [4]

P.T.O.

Or

2. (a) Explain TCP/IP protocol suites. [8]  
(b) What is the difference between information and signal ? [4]  
(c) Explain Delta modulation. [4]

3. (a) Draw a neat waveform for amplitude modulation :  
(i) Modulating signal  
(ii) Carrier signal  
(iii) Amplitude modulated signal  
(iv) Frequency spectrum of AM wave. [8]  
(b) Explain FHSS and DSSS. [8]

Or

4. (a) Explain the following shift keying techniques with suitable diagram :  
(i) ASK  
(ii) FSK  
(iii) PSK  
(iv) QAM. [8]  
(b) Explain FDM and statistical TDM. [8]

5. Write short notes on :  
(i) Guided Media. [6]  
(ii) Packet Switched Networks. [6]  
(iii) Structure of Circuit Switches. [6]

Or

6. Write short notes on :

- (i) Unguided Media. [6]
- (ii) Datagram network. [6]
- (iii) HDSL and SDSL. [6]

## SECTION II

7. (a) Discuss the hamming code technique. Calculate hamming code if data to be sent is 1001101. [8]
- (b) Explain stop and wait ARQ, GO Back-n ARQ and selective repeat ARQ. Comment on the performance of each. [8]

Or

8. (a) Explain various Station types and configurations used in HDLC. [8]
- (b) What is CRC ? Generate the CRC code for message 1001101010. Given generator polynomial :

$$g(x) = x^4 + x^2 + 1. \quad [8]$$

9. (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*

- 10.** (a) Explain FDMA, TDMA and CDMA in detail. [8]
- (b) Discuss Gigabit Ethernet with reference to the following :
- (i) MAC Sublayer
  - (ii) Gigabit Ethernet Frames
  - (iii) 1000 Base X Specification. [8]

- 11.** Write short notes on :

- (i) Virtual LAN. [6]
- (ii) Working of Switch and Router. [6]
- (iii) SONET Layers. [6]

*Or*

- 12.** Write short notes on :

- (i) Backbone Network. [6]
- (ii) SONET Devices. [6]
- (iii) Two-layer and three-layer switches. [6]