May - June - 2011

Total No. of Questions—12] [Total No. of Printed Pages—4

[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 :

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