Total No. of Questions—12]

Seat	
No.	

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# S.E. (I.T.) (Second Semester) EXAMINATION, 2014 DATA COMMUNICATIONS

### (2008 PATTERN)

#### **Time : Three Hours**

#### Maximum Marks : 100

- **N.B.** :— (i) Answers to the two Sections should be written in separate answer-books.
  - (ii) Neat diagrams must be drawn wherever necessary.
  - (*iii*) Figures to the right indicate full marks.
  - (iv) Use of calculator is allowed.
  - (v) Assume suitable data, if necessary.

#### SECTION I

- 1. (a) Compare ISO-OSI model with TCP-IP model. Which model is prepared in internet ? Why ? [8]
  - (b) State and explain Nyquist theorem and Shannon's channel capacity theorem. Consider a channel with 1MHz bandwidth, The SNR for this channel is 63. What is appropriate bit rate and signal level ?

P.T.O.

- 2. (a) Explain serial and parallel transmission modes used in DataCommunication. [8]
  - (b) List and explain various line coding techniques with examples. [10]
- (a) Derive an expression for AM wave in time domain and plot frequency spectrum of AM.
   [8]
  - (b) Compare Direct sequence-SS and Frequency hopping-SS. [8]

## Or

4. (a) What is FDM ? Draw and explain FDM multiplexing and De-multiplexing process. [8]

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- (b) Explain the following shift keying techniques with suitable examples : [8]
  - (i) ASK
  - (ii) FSK
  - (iii) PSK
  - (iv) QAM.

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- 5. (a) Explain various types of unguided media in detail. [8]
  - (b) Compare Circuit switching, Message switching, Packet switching.

#### Or

- 6. (a) Explain types of fiber and compare them. [8]
  - (b) Explain the terms ADSL, ADSL lite, HDSL and SDSL. [8]

#### SECTION II

- (a) Explain with suitable example, generation of Hamming codes.
   [8]
  - (b) What is CRC ? Explain CRC generator and CRC checker with suitable example. [10]

#### Or

- 8. (a) Discuss Point to Point (PPP) protocol stack with its appropriate frame formats. [8]
  - (b) Explain in detail Basic Stop and Wait, Go-Back-N, and Selective repeat ARQ system. [10]
- 9. (a) Explain the following physical layer implementation in fast
  Ethernet: [8]
  - (i) 100BaseTX

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### P.T.O.

- (*ii*) 100BaseFX
- (iii) 100BaseT4

with respect to media, maximum length and line encoding.

(b) Compare and contrast FDMA, TDMA and CDMA. [8]

#### Or

- 10. (a) Write short notes on : [8]
   (i) IEEE 802.4 (Token bus)
  - (ii) IEEE 802.5 (Token ring).
  - (b) Discuss fast Ethernet technology in brief. State its specification. [8]
- 11. (a) Compare Hub, Repeaters, Bridge, Routers in detail. [8]
  - (b) Draw and explain BUS and STAR backbone network. [8]

#### Or

- 12. (a) What is virtual LAN ? State the advantages of VLAN. [8]
  - (b) Write short notes on : [8]
    - (i) SONET layers
    - (*ii*) SONET Multiplexing.

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