

Total No. of Questions—12]

[Total No. of Printed Pages—4

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**[4857]-216****S.E. (I.T) (Second Semester) EXAMINATION, 2015****DATA COMMUNICATION****(2008 PATTERN)****Time : Three Hours****Maximum Marks : 100**

- N.B. :—** (i) Answer Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6, from Section I and Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 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 with help of block diagram PCM in detail. What is the distortion in PCM ? How is it eliminated ? [10]
- (b) Explain various transmission impairments present in data communication. [8]

*Or*

2. (a) Draw ISO-OSI model in detail clearly mentioning the function of each layer. [10]
- (b) Explain the factors used to judge the network performance. [8]

P.T.O.

- 3.** (a) Explain the following shift keying techniques with suitable examples : [8]
- (i) ASK
  - (ii) FSK
  - (iii) PSK
  - (iv) QAM.
- (b) Explain TDM and statically TDM. Mention advantages and disadvantages. [8]

*Or*

- 4.** (a) Compare AM and FM with respect to the following points : [8]
- (1) Waveform
  - (2) Mathematical equation
  - (3) Frequency spectrum
  - (4) Modulation index. [8]
- (b) State the principle of spread spectrum modulation and explain DS-spread spectrum modulation. [8]
- 5.** (a) Explain various types of unguided media in detail. [8]
- (b) Explain the terms ADSL, ADSL lite, HDSL and SDSL. [8]

*Or*

- 6.** (a) What is fiber optics communication ? Explain step index and graded index fiber. [8]
- (b) Compare Circuit Switching, Message Switching and Packet Switching. [8]

## SECTION II

7. (a) What is Hamming code ? Explain with suitable example, generation of Hamming codes. [10]
- (b) What is parity check ? Explain two-dimensional parity check method in detail. [8]

*Or*

8. (a) What is CRC ? Explain CRC generator and CRC checker with suitable example. [10]
- (b) Discuss High Level Data Link Control (DHLC) protocol with its appropriate frame formats. [8]
9. (a) Compare and contrast FDMA, TDMA and CDMA. [8]
- (b) Explain the following physical layer implementation in standard ethernet :
- (i) 10Base5
- (ii) 10Base2.
- with respect to media, maximum length and line encoding. [8]

*Or*

10. (a) Discuss CSMA/CA random access technique. How collision avoidance is achieved in this technique ? [8]
- (b) Write short notes on :
- (i) IEEE 802.4 (Token Bus)
- (ii) IEEE 802.5 (Token Ring). [8]

- 11.** (a) What is bridge ? Explain type of bridges. Explain frame filtering. Why are bridges are called self-learning devices ? [8]
- (b) Draw and explain SONET architecture with SONET layers, SONET frames. [8]

*Or*

- 12.** (a) Draw and explain BUS backbone network and STAR backbone network. [8]
- (b) What is virtual LAN ? Explain how set up VLAN using layer 2 switches. [8]

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