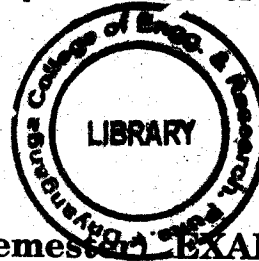Total No. of Questions—12]   [Total No. of Printed Pages—4

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[4162]-216

S.E. (Information Tech.) (Second Semester) EXAMINATION, 2012

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) Answer Q. No. **1** or Q. No. **2**, Q. No. **3** or Q. No. **4** and Q. No. **5** or Q. No. **6** from Section I, Q. No. **7** or Q. No. **8**, Q. No. **9** or Q. No. **10**, and Q. No. **11** or Q. No. **12** from Section II.

(iv) Figures to the right indicate full marks.

(v) Assume suitable data if necessary.

SECTION I

1. (a) Explain various addresses in TCP/IP protocol suit.   [8]

   (b) Explain the various transmission impairments in data communications.   [4]

   (c) What is PCM ? Describe with the help of diagram.   [4]

                                    P.T.O.

Or

2. (*a*) What is serial transmission ? Explain synchronous and asynchronous transmission. [8]

(*b*) Explain block coding with 8B/10B as an example. [8]

3. (*a*) An analog signal has a bit rate of 8000 bps and a baud rate of 1000 baud. How many data elements are carried by each signal element ? How many signal elements do we need ? [8]

(*b*) Explain FHSS and DSSS. [8]

Or

4. (*a*) Explain FDM and statistical TDM. [8]

(*b*) Explain the following shift keying techniques with suitable diagram : [8]

    (*i*) ASK

    (*ii*) FSK

    (*iii*) PSK

    (*iv*) QAM.

5. Write short notes on :

    (*i*) Co-axial cable and fiber optic cable [6]

    (*ii*) Unguided media [6]

    (*iii*) Virtual circuit networks. [6]

Or

6. (a) Explain different modem standards. [6]

   (b) Explain the terms ADSL, ADSL lite and HDSL. [6]

   (c) Explain structure of circuit switches. [6]

SECTION II

7. (a) Explain error detection and error correction in block coding. [8]

   (b) What is Hamming distance ? What is the minimum hamming distance ? [4]

   (c) What is CRC ? Explain with figure CRC encoder and decoder. [6]

Or

8. (a) What is checksum ? Describe in detail internet checksum method with suitable example. [8]

   (b) Explain stop-and-wait ARQ protocol. [6]

   (c) What is piggybacking in Go-Back-N ARQ. [4]

9. (a) Discuss CSMA/CD random access technique. How is collision avoidance achieved in the same ? [8]

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

Or

10. (a) Describe different controlled access protocol mentioned below :

        (*i*) Reservation

        (*ii*) Polling.   [8]

   (b) Describe gigabit ethernet with reference to the following :

        (*i*) MAC sublayer

        (*ii*) Frame bursting

        (*iii*) Topology.   [8]

11. Attempt any *two* questions from the following :   [16]

   (a) Draw and explain SONET layers in detail.

   (b) Explain two-layer and three-layer switches.

   (c) Write a short note on bridges.

Or

12. (a) Write a short note on "Backbone network".   [6]

   (b) Explain the terms :   [6]

        (*i*) Passive hubs

        (*ii*) Repeaters

        (*iii*) Active hub.

   (c) Discuss the working of VLAN ?   [4]