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06CS55

Fifth Semester B.E. Degree Examination, December 2011
Computer Networks – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. What is data communication? Explain the fundamental characteristics on which effectiveness of data communication depends.   **(06 Marks)**
   b. Differentiate between LAN, WAN and MAN.   **(04 Marks)**
   c. Explain the OSI reference model for computer networks.   **(10 Marks)**

2 a. What are the factors on which data rate depends in data communications?   **(04 Marks)**
   b. Explain the different causes for transmission impairments during signal transmission through media.   **(06 Marks)**
   c. Explain with a neat diagram, the components of a PCM encoder.   **(10 Marks)**

3 a. With the help of a neat diagram, explain the ASK, FSK and PSK. Discuss the bandwidth requirement in each case.   **(10 Marks)**
   b. What is spread spectrum? Explain the following techniques for spread spectrum: FHSS and DSSS.   **(10 Marks)**

4 a. Explain the principles of optical fiber communication. Discuss the advantages and disadvantages of optical fibers.   **(06 Marks)**
   b. Obtain the CRC code word using generator polynomial $g(x) = x^3 + x + 1$, for the data [1001]. Give the hardware realization of CRC divisor.   **(08 Marks)**
   c. With the help of an example, explain the computation of internet checksum. Explain how the error detection is done, using internet checksum.   **(06 Marks)**

PART – B

5 a. Explain with the help of examples, the concepts of bit stuffing and byte stuffing. **(04 Marks)**
   b. Explain step and wait ARQ protocol, with the help of a neat diagram.   **(06 Marks)**
   c. Explain the frame formats and control fields for different types of HDLC frames. **(10 Marks)**

6 a. An ALOHA network transmits 200 bit frame on a shared channel of 200 kbps. If the system produces 1000 frames per second, obtain the throughput.   **(06 Marks)**
   b. What is CSMA? Explain the different persistence methods of CSMA.   **(06 Marks)**
   c. Explain the 802.3 MAC frame format.   **(08 Marks)**

7 a. Explain the different types of addressing mechanisms in IEEE 802.11.   **(10 Marks)**
   b. Write short notes on: i) TDD TDMA   ii) Virtual LAN.   **(10 Marks)**

8 a. Explain w.r.t SONET, the following:
      i) SONET layers   ii) SONET frame format   iii) STS multiplexing.   **(12 Marks)**
   b. Explain w.r.t ATM, the following:
      i) ATM network architecture   ii) ATM frame formats.   **(08 Marks)**

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