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**Fifth Semester B.E. Degree Examination, June/July 2014**  
**Computer Networks – I**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART – A**

- 1
  - a. What is data communication? What are its four fundamental characteristics? With a neat diagram, explain the components of data communication system. (08 Marks)
  - b. Assume that five devices are connected in a mesh topology. How many cables are needed? How many ports are needed for each device? (02 Marks)
  - c. With a neat diagram, explain the functionalities of each layer of OSI reference model. (10 Marks)
- 2
  - a. Explain the different causes for transmission impairments during signal transmission through media. (06 Marks)
  - b. Define bandwidth. A periodic signal has bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the lowest frequency? Draw the spectrum, if signal contains all frequencies of same amplitude. (04 Marks)
  - c. What is line coding? Describe and represent the information sequence '101000110' using Biphase and Bipolar schemes. (10 Marks)
- 3
  - a. What is multiplexing? With neat diagram, explain FDM. (06 Marks)
  - b. What is spread spectrum? Explain with an example direct sequence spread spectrum. (06 Marks)
  - c. With a neat diagram, explain how message can be sent from one system to another using datagram networks. (08 Marks)
- 4
  - a. Define hamming distance. Explain simple parity check code  $C(5, 4)$  with  $d_{\min} = 2$ . How many bits can be corrected? (06 Marks)
  - b. Find the code word  $c(x)$ , using CRC for the information  $d(x) = x^3 + 1$  with generator polynomial  $t(x) = x^3 + x + 1$ . (08 Marks)
  - c. Explain with an example. The computation of internet checksum. List the steps undertaken by the sender and receiver for error detection. (06 Marks)

**PART – B**

- 5
  - a. Why bit stuffing and byte stuffing are needed? Explain them, with examples. (06 Marks)
  - b. With neat figures, explain briefly: i) Go-back n ii) selective repeat ARQ protocols. (10 Marks)
  - c. Explain the frame format of PPP protocol. (04 Marks)
- 6
  - a. Describe CSMA/CD protocol, with neat flow diagram. (06 Marks)
  - b. What is channelization? Explain CODE division multiple access, with an example. (08 Marks)
  - c. Discuss 802.3 MAC frame format and frame length. (06 Marks)
- 7
  - a. Explain the different types of addressing mechanisms in IEEE 802.11. (06 Marks)
  - b. With neat diagram, explain layers of Bluetooth. (06 Marks)
  - c. What is a bridge? Explain with an example the bridge learning and forwarding process of transparent bridge. (08 Marks)
- 8
  - a. Explain the following fields in IPV4 packet header :  
i) Identification ii) flags iii) fragmentation offset. (06 Marks)
  - b. What is NAT? How can NAT help in address depletion with a neat diagram? (06 Marks)
  - c. What is the need to change from IPV4 to IPV6? Write IPV6 basic header and describe its fields. (08 Marks)

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