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CBCS Scheme

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Data Communication and Networking

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define data communication. Explain the fundamental characteristics of a data communication system. With a neat diagram, explain the components of data communication. **(06 Marks)**
   b. Explain TCP/IP protocol suite of computer networks with a neat diagram. **(08 Marks)**
   c. Assume that five devices are connected in a mesh topology. How many duplex links are needed? How many ports are needed for each? **(02 Marks)**

OR

2 a. Explain different causes for transmission impairments during signal transmission through media. **(06 Marks)**
   b. Define line coding. List out its characteristics. Represent the sequence 10100110 using polar and biphase schemes. **(08 Marks)**
   c. A network with a bandwidth of 10 Mbps can pass only an average of 18000 frames per minute with each frame carrying an average of 10000 bits. What is the throughput of this network? **(02 Marks)**

Module-2

3 a. Explain with suitable diagram PCM encoder used for analog to digital conversion with example. **(08 Marks)**
   b. Define multiplexing. State and explain the data rate management to handle disparity in input data rates in TDM. **(05 Marks)**
   c. Four 1 Kbps connections are multiplexed together. A unit is 1 bit. Find:
      i) Duration of 1 bit before multiplexing.
      ii) Transmission rate of link.
      iii) Duration of each time slot. **(03 Marks)**

OR

4 a. Briefly explain with neat diagrams, ASK and FSK modulation techniques and specify the bandwidth requirement. **(06 Marks)**
   b. We need to send data 3 bits at a time at a bit rate of 3 Mbps. The carrier frequency is 10 MHz. Calculate the number of levels (different frequencies, band rate and band width). **(04 Marks)**
   c. Explain how message can be sent from one system to another using datagram approach and calculate the total delay with appropriate diagrams. **(06 Marks)**

Module-3

5 a. Find the code word at sender site using CRC given dataword 101001111 and generator 10111. **(05 Marks)**
   b. Explain different frame types in HDLC. **(06 Marks)**
   c. Explain transition phases of PPP protocol. **(05 Marks)**

OR

6 a. Explain with neat diagram, simple parity check code. (06 Marks)
   b. Explain with examples, computation of internet checksum. List the steps undertaken by sender and receiver for error detection. (05 Marks)
   c. Explain stop-and-wait protocol with appropriate diagrams. (05 Marks)

Module-4

7 a. Explain working of CSMA/CD with suitable flow diagram. (07 Marks)
   b. A network using CSMA/CD has a bandwidth of 10 Mbps. If the propagation time is 25.6 μs, what is the minimum size of the frame? (03 Marks)
   c. Define Bluetooth and explain the architecture of the same. (06 Marks)

OR

8 a. Define is channelization. Explain CDMA with an example. (06 Marks)
   b. A pure ALOHA network transmits 200 bits frames on a shared channel of 200 kbps. What is the throughput if the system produces 1000 frames per second. (04 Marks)
   c. Discuss 802.3 MAC frame format. (06 Marks)

Module-5

9 a. Explain the operation of cellular telephony. (06 Marks)
   b. Explain transition from IPV4 to IPV6. (06 Marks)
   c. Discuss special addresses supported by IPV6. (04 Marks)

OR

10 a. Explain IP datagram header format with neat diagram and give the description of each field. (08 Marks)
    b. Explain the working of mobile IP with diagram. (08 Marks)

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