CBCS Scheme

USN ☐☐☐☐☐☐☐☐☐☐ **15CS46**

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)**

* * * * *