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18CS46

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021
Data Communication

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Define data communication. Explain fundamental characteristics of data communication system. **(06 Marks)**
   b. State five basic data communication components, briefly explain their functions. **(06 Marks)**
   c. What are the advantages of having layered model for networking? Explain important functions of OSI model. **(08 Marks)**

OR

2 a. What is transmission impairment? Briefly explain three causes of transmission impairment **(06 Marks)**
   b. Explain briefly about Shanon capacity and Nyquist bit rate for communication channels. **(06 Marks)**
   c. Distinguish :
   i) Baseband and Broadband
   ii) Bandwidth and Throughptut
   iii) Latency and Jitter
   iv) Dejure and Defacto model. **(08 Marks)**

Module-2

3 a. What is line coding? Mention different characteristics of line coding techniques. **(06 Marks)**
   b. Explain Non–Return–To–Zero (NRZ) line coding scheme with example. Give the NRZ, NRZ-I and Manchester encodings for bit stream 0011111000. **(06 Marks)**
   c. Mention different digital to analog conversion techniques. Explain with neat diagram Amplitude Shift Keying (ASK) and Frequency Shift Keying(FSK) conversion techniques. Specify bandwidth requirements. **(08 Marks)**

OR

4 a. Explain the three step procedure of Pulse Code Modulation (PCM) for analog to digital conversion with example. **(06 Marks)**
   b. Describe briefly about different transmission modes. **(06 Marks)**
   c. Define constellation diagram and explain its role in transmission. Explain quadrature amplitude modulation with some constellation diagrams. **(08 Marks)**

Module-3

5 a. What is switching? What are the different types of switching techniques? **(06 Marks)**
   b. What is Hamming distance? Discuss about minimum Hamming distance. **(06 Marks)**
   c. Explain the need for multiplexing. Four 1kbps connections are multiplexed together. A unit is 1 bit find :
   i) The duration of 1 bit before multiplexing
   ii) The transmission rate of the link
   iii) The duration of a time slot
   iv) The duration of a frame. **(08 Marks)**

OR

6 a. Describe about Direct Sequence Spread Spectrum (DSSS). (06 Marks)
   b. Distinguish statistical TDM from synchronous TDM. (06 Marks)
   c. Explain Cycle Redundancy Check (CRC). Assume that data is 10110 and the code generator is 1101. Calculate CRC bits. (08 Marks)

Module-4

7 a. Explain 3 different persistence methods of CSMA with flow diagram. (06 Marks)
   b. Mention different controlled access protocols. Explain token passing method. (06 Marks)
   c. Explain the three strategies used in CSMA/CA to avoid collision. (08 Marks)

OR

8 a. Explain bit stuffing and byte stuffing with example. (06 Marks)
   b. What is Classless Inter Domain Routing (CIDR)? (06 Marks)
   c. Explain the fundamental principle of CDMA channelization method with sample codes. (08 Marks)

Module-5

9 a. With a schematic explain Ethernet frame format. Why Ethernet has maximum and minimum frame length limitations. (06 Marks)
   b. Distinguish unicast, multicast and broadcast addresses. Define the types of following destination addresses.
      i)   4A : 30 : 10 : 21 : 10 : 1A
      ii) 47 : 20 : 1B : 2E : 08 : EE
      iii) FF : FF : FF : FF : FF : FF. (06 Marks)
   c. What are the goals of fast Ethernet? Give a brief account on challenges in fast Ethernet about access method. (08 Marks)

OR

10 a. Describe about IEEE 802.11 addressing mechanism with a frame diagram. (06 Marks)
   b. Explain about Bluetooth technology. (06 Marks)
   c. Elucidate on GSM architecture. (08 Marks)

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