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17CS46

Fourth Semester B.E. Degree Examination, Feb./Mar. 2022
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. What is Data Communication? Explain the fundamental characteristics of Data Communication. **(06 Marks)**

b. What are the principles of protocol layering? Explain the layers in the TCP/IP protocol suite, with a neat diagram. **(08 Marks)**

c. Compare the four basic topology with a neat diagram. **(06 Marks)**

OR

2 a. Describe the various transmission impairments of data communication. **(09 Marks)**

b. Compare and contrast the simplex, half duplex and full duplex, dataflow in data communication. **(06 Marks)**

c. Assume that $SNR_{dB} = 36$, channel band width is 2MHz calculate signal to noise ratio (SNR) and channel capacity. **(05 Marks)**

Module-2

3 a. Define line coding. Draw the line coding for a sequence 10110001 using i) NRZ-L ii) NRZ-I iii) RZ iv) Manchester coding. **(10 Marks)**

b. Discuss pulse code modulation mechanism and explain quantization and encoding of sampled signals. **(10 Marks)**

OR

4 a. List out the different transmission modes and briefly explain with an examples. **(07 Marks)**

b. An analogy signal has a bit rate of 8000 bps and band rate of 1000 bands, how many data elements are carried by each signal element and how many signal elements does it need. **(05 Marks)**

c. Describe Frequency Shift Keying (FSK) and Amplitude Shift Keying (ASK) with neat diagram. **(08 Marks)**

Module-3

5 a. Define multiplexing. Explain frequency division multiplexing with an example. **(07 Marks)**

b. Explain Frequency Hopping Spread Spectrum (FHSS) and Direct sequence spread spectrum with a neat sketch. **(07 Marks)**

c. Explain the mechanism of CRC encoder and decoder. **(06 Marks)**

OR

6 a. What is circuit switching? List out characteristics of it and analyze the three phase of it. **(10 Marks)**

b. What is checksum? Write an algorithm to calculate traditional checksum? How to justify the corrupted data received or uncorrupted data received from the checksum (7, 11, 12, 0, 9) for these five data numbers are sent from source to destination. **(10 Marks)**

Module-4

7 a. Explain frame formats of HDLC protocol. **(05 Marks)**

b. Explain stop and wait protocol with data flow diagram. **(05 Marks)**

c. What is Random access? Explain procedure of pure ALOHA protocol, find out throughput for pure ALOHA network which transmits 200 bits frames on shared channel of 200kbps for
   - i) 1000 frames per second
   - ii) 500 frames per second
   - iii) 250 frames per second. **(10 Marks)**

OR

8 a. Explain polling with a neat diagram. **(06 Marks)**

b. Describe transition phases of PPP protocol. **(06 Marks)**

c. Describe classful addressing with an example. **(08 Marks)**

Module-5

9 a. Explain GIGABIT Ethernet design techniques. **(10 Marks)**

b. Explain Architecture of Bluetooth and describe logical link control of it. **(10 Marks)**

OR

10 a. What is cellular telephony? Explain its operations. **(10 Marks)**

b. Discuss second generation of cellular telephony. **(10 Marks)**

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