



CBCS SCHEME

18CS46

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Fourth Semester B.E. Degree Examination, July/August 2021 Data Communication

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1
 - a. What is data communication? Explain the fundamental characteristics and components of a data communication system. (08 Marks)
 - b. Explain TCP/IP protocol suite of computer networks with a neat diagram. (08 Marks)
 - c. Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels. What is the maximum bit rate? (04 Marks)
- 2
 - a. Explain the different kinds of network topologies with advantages and disadvantages of each. (08 Marks)
 - b. Explain digital signal transmission methods in detail. (08 Marks)
 - c. A network with bandwidth of 10 Mbps can pass only an average of 12000 frames per minutes with each frame carrying an average of 10000 bits. What is the throughput of this network? (04 Marks)
- 3
 - a. Define line coding. List out its characteristics. (08 Marks)
 - b. Explain different data transmission modes in detail. (07 Marks)
 - c. Represent the sequence 1011001011 using polar and biphasic schemes. (05 Marks)
- 4
 - a. Explain with suitable diagram PCM encoder used for analog to digital conversion. (08 Marks)
 - b. Briefly explain with neat diagrams, ASK and FSK modulation techniques and specify the bandwidth requirement. (08 Marks)
 - c. We have an available bandwidth of 100 kHz which spans from 200 to 300 kHz. What are the carrier frequency and the bit rate if we modulated our data by using ASK with $d = 1$. (04 Marks)
- 5
 - a. Explain different categories of multiplexing in detail. (08 Marks)
 - b. What is spread spectrum? Explain FHSS and DSSS. (08 Marks)
 - c. Four 1 Kbps 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. (04 Marks)
- 6
 - a. What is circuit switching? Enumerate the characteristics of circuit switching and analyze the advantages of circuit switching. (08 Marks)
 - b. Explain with neat diagram, simple parity check code. (08 Marks)
 - c. Find the code word at sender site using CRC given dataword 101001111 and generator 10111. (04 Marks)
- 7
 - a. Explain stop and wait protocol with appropriate diagrams. (08 Marks)
 - b. Explain the working of CSMA/CD with suitable flow diagram. (08 Marks)
 - c. Explain transition phases of PPP protocol. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

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- 8 a. Describe pure ALOHA and slotted ALOHA. (08 Marks)
b. What is channelization? List and explain the channelization protocols. (08 Marks)
c. Explain the working of ARP with a neat diagram. (04 Marks)
- 9 a. Explain Ethernet frame format with a neat diagram. (08 Marks)
b. Describe Gigabit Ethernet. (06 Marks)
c. Explain the architecture of IEEE 802.11. (06 Marks)
- 10 a. Explain the architecture of Bluetooth. (08 Marks)
b. Explain the operation of cellular telephony. (06 Marks)
c. Explain fourth generation (4G) of cellular telephony. (06 Marks)

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