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Fourth Semester B.E. Degree Examination, Dec.2024/Jan.2025 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 the fundamental components of data communication. (05 Marks)
b. With neat diagram explain the functionalities of each layer of OSI reference model. (10 Marks)
c. What are ISPs? List and discuss different types of ISPs. (05 Marks)

OR

- 2 a. State the following terms : analog, digital, periodic, and non-periodic signals. Also sketch these signals. (06 Marks)
b. What do you mean by transmission impairment? Explain the three causes of transmission impairment. (08 Marks)
c. Write a note on the characteristics influencing the performance of the networks. (06 Marks)

Module-2

- 3 a. List any three line coding techniques, and represent the sequence 10110011 using techniques. (05 Marks)
b. Explain the PCM techniques of changing analog signal to digital signal with neat diagram of PCM encoder and decoder. (10 Marks)
c. What do you mean by sampling? Explain the three sampling methods with neat diagram. (05 Marks)

OR

- 4 a. Discuss the following transmission modes :
i) Parallel
ii) Serial
iii) Synchronous
iv) Asynchronous transmissions. (06 Marks)
b. Define digital-to-analog conversion. List and define different types of digital-to-analog conversion. (06 Marks)
c. Define frequency shift keying. Explain binary frequency shift keying and its implementation. (08 Marks)

Module-3

- 5 a. Highlight the concepts of multiplexing and list the categories of multiplexing. (04 Marks)
b. Explain in detail synchronous time division multiplexing. (08 Marks)
c. What is frequency hopping spread spectrum? Explain how it achieves bandwidth multiplexing. (08 Marks)

OR

- 6 a. Analyze in detail circuit switched network with neat diagram. (06 Marks)
 b. Describe virtual-circuit network. Discuss the five characteristics of virtual-circuit network. (08 Marks)
 c. Recall cyclic redundancy check with block diagram. Also explain CRC with an example. (06 Marks)

Module-4

- 7 a. What is the need for bit and byte stuffing at data link layer? Explain them with examples. (08 Marks)
 b. Discuss the three types of HDLC frames with neat diagrams. (08 Marks)
 c. Explain the transition phases of point-to-point protocol with relevant diagram. (04 Marks)

OR

- 8 a. What is channelization? List and explain the channelization protocols. (10 Marks)
 b. Discuss IPv4 addressing scheme and Dynamic Host Configuration Protocol (DHCP). (06 Marks)
 c. Write short notes on Networks Address Translation. (04 Marks)

Module-5

- 9 a. With a neat diagram, explain the structure of 802.3 frame format. (08 Marks)
 b. How Bridge Networks Improves DLL performance? What are the goals of Fast Ethernet? (08 Marks)
 c. Explain 10 Gigabit Ethernet implementation. (04 Marks)

OR

- 10 a. Describe the MAC layer in IEEE 802.11 standard. (06 Marks)
 b. Highlight the architecture of Bluetooth and explain its frame. (04 Marks)
 c. Explain the operation of cellular telephony with neat diagram. (10 Marks)
