A–1108

Total Pages : 4 **Roll No. .....**

MCA–19

MCA

(Data Communication and Computer Networks)

5th Semester Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

(Long Answer Type Questions) 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Describe the OSI model in detail. Explain the functions of each layer and how they interact with each other in the context of data communication.

2. Define network topology and discuss the different types of network topologies, including their characteristics, advantages, and disadvantages. Provide examples of where each topology might be used.

3. Describe the concept of wavelength in relation to signal frequency. Explain how wavelength is calculated and discuss its significance in the design and performance of communication systems.

4. Compare and contrast circuit switching with packet switching. Highlight the advantages and disadvantages of each method, and provide examples of applications where each is most suitable.

5. Discuss the various error detection techniques used in data communication. Explain how parity checks (even and odd parity) work, providing examples of their application and limitations.

Section–B

(Short Answer Type Questions) 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Describe the process of multiplexing in data communications. Explain different types of multiplexing techniques and their applications.

2. Discuss the architecture and functioning of Local Area Networks (LANs). Explain the role of Ethernet and the IEEE 802.3 standard in LANs.

3. Explain the differences between analog and digital signals. Discuss their respective characteristics, advantages, and disadvantages, and provide examples of where each type of signal is commonly used.

4. Discuss the process of digitization in the telephone network. Explain how analog voice signals are converted to digital signals, transmitted, and then converted back to analog at the receiving end.

5. Describe the structure and functioning of a routing table. Explain how routers use routing tables to determine the best path for packet forwarding.

6. Describe the ARP process in detail. Explain how an ARP request is generated and broadcasted, and how an ARP reply is received and processed by the requesting host.

7. Explain the structure and components of an IPv6 header. Discuss the significance of each field in the header and how they are used ?

8. Differentiate between unicast and multicast routing.

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