



K.R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

Rollno.....

End Semester Examination, December 2024
Program-B.Tech (EEE) – VIIth Semester
Data Communication Networks (ETEC425A)

Time: 2.5 hrs.

Max Marks: **50**

Note: **All Questions are compulsory.** Marks are indicated against each question.

PART-A

Q.1 *Attempt any five questions:*

- (a) What are the main differences between circuit switching and packet switching [CO-1] [L-1] **2**
- (b) What is the purpose of a repeater in data communication? [CO2] [L-1]
2
- (c) Describe the role of IP addressing in networking [CO-1] [L-1]
2
- (d) What is the function of a router in a network [CO-3] [L-2]
2
- (e) Explain the difference between simplex and duplex communication. [CO-1] [L-1]
2
- (f) What is the purpose of error detection codes?
Name two error detection techniques [CO-1] [L-2]
2
- (g) Explain the significance of subnetting in IP networks. [CO-1] [L-2]
2
2x5

PART-B

Q.2 Describe the TCP/IP model. Compare it with the OSI model and discuss the functions of each layer. [CO-2] [L-2] **10**

OR

What is multiplexing? Explain Frequency Division Multiplexing (FDM) and Time Division Multiplexing. [CO-2] [L-2] **10**

Q.3 Explain the **ALOHA protocol** in detail, including its types, operation, advantages, disadvantages, and efficiency. Discuss how the protocol manages access in a shared communication channel and

describe the key differences between Pure ALOHA and Slotted ALOHA. Also, calculate the maximum throughput efficiency for both types of ALOHA protocols.

[CO-3] [L-3]

10

OR

Discuss the connection-oriented and connectionless protocols in networking by providing a detailed comparison of their characteristics.

[CO-3] [L-3]

10

Q.4

Discuss the causes and impact of **congestion** in a network. Explain the stages of congestion and how it affects throughput, delay, and packet loss. Describe different congestion control techniques.

[CO-4] [L-2] **10**

OR

Explain the concept of **subnetting** and its importance in IP networks. Describe the process of subnetting, including how to calculate subnet masks, network addresses, and broadcast addresses.

[CO- 4] [L-2]

10

Q.5

Describe the **role of the HTTP protocol** in the functioning of the World Wide Web. Discuss the differences between HTTP and HTTPS and their importance in ensuring web security.

[CO-4] [L-2] **10**

OR

Explain the concept of **search engines** on the World Wide Web. Describe how search engines crawl, index, and rank web pages to provide relevant results to users.

[CO- 4] [L-3] **10**