

Code: 21E00401d

MBA IV Semester Supplementary Examinations November 2024

DATA COMMUNICATION AND NETWORK ANALYSIS

(Master of Business Administration)

Time: 3 hours

Max. Marks: 60

All questions carry equal marks

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

- 1 (a) Discuss the concept of terminal handling in data communication networks. What are the key responsibilities of terminal handling systems? Provide examples of terminal handling processes in various network environments. 5M
- (b) Explain the importance of error correction in data communication networks. How do error correcting codes help in detecting and correcting errors during data transmission? Provide examples of commonly used error correcting codes. 5M
- OR
- 2 (a) What is meant by Hierarchical Network? Explain about connectivity analysis and delay analysis in hierarchical network. 5M
- (b) Describe the design considerations for local access networks. What factors should be taken into account when designing local access networks for different environments? Discuss the challenges associated with local access network design and potential solutions. 5M
- 3 (a) Explain the centralized hierarchical algorithm used in the network layer of data communication networks. How does this algorithm facilitate routing and packet forwarding? Discuss the advantages and disadvantages of centralized hierarchical routing. 5M
- (b) Compare and contrast virtual circuits and datagrams in the network layer. What are the key differences between these two approaches in terms of routing, packet delivery, and network overhead? Explain when it is appropriate to use virtual circuits versus datagrams. 5M
- OR
- 4 (a) Discuss the concept of broadcasting algorithms in the context of the network layer. How do broadcasting algorithms enable efficient communication in networks? Provide examples of broadcasting algorithms and their applications in real-world network scenarios. 5M
- (b) Discuss the advantages and disadvantages of using virtual circuits in the network layer. How does the establishment of virtual circuits impact network performance and resource utilization? Provide examples to illustrate your points. 5M
- 5 (a) Explain the concept of crash recovery in the transportation layer. What are the steps involved in crash recovery, and how does it ensure data integrity and reliability? Discuss the role of acknowledgment and retransmission in crash recovery mechanisms. 5M
- (b) Explain the role of the session layer in data communication networks. What are the key functions performed by the session layer? Discuss the importance of session establishment and termination in ensuring reliable communication between network entities. 5M
- OR
- 6 (a) Describe the process of addressing in the transportation layer. How are addresses assigned to data packets, and how do they facilitate data delivery to the intended destination? Discuss the differences between logical and physical addressing. 5M
- (b) Explain the concept of buffering in the transportation layer. How does buffering help in managing data traffic and ensuring smooth data transmission? Discuss the trade-offs involved in buffer size selection and its impact on network performance. 5M

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- 7 (a) Explain the concept of data encryption in the context of the presentation layer. How does encryption help protect sensitive information during transmission? Discuss the differences between symmetric and asymmetric encryption algorithms. 5M
- (b) Discuss the role of authentication in ensuring network security. How does authentication verify the identity of users or devices in a network? Explain the importance of authentication protocols in preventing unauthorized access. 5M
- OR
- 8 (a) Discuss the importance of file transfer protocols in data communication networks. What are the key features of file transfer protocols, and how do they facilitate efficient and secure file transfer? Provide examples of widely used file transfer protocols. 5M
- (b) Explain the concept of network security and privacy in the presentation layer. How do security mechanisms such as encryption, authentication, and digital signatures contribute to protecting data confidentiality and integrity? Discuss the implications of security breaches in network communication. 5M
- 9 (a) Discuss the concept of distribution systems in the application layer. How do distribution systems facilitate the efficient delivery of data and services in networked environments? Provide examples of distribution systems commonly used in modern networks. 5M
- (b) Describe the services provided by the application layer in data communication networks. How do application layer protocols enable tasks such as file transfer, email communication, and web browsing? Provide examples of popular application layer protocols and their functions. 5M
- OR
- 10 (a) Explain the significance of the application layer in supporting distributed computing environments. How do distributed applications leverage the capabilities of the application layer to achieve scalability and fault tolerance? Discuss the challenges associated with developing and managing distributed applications. 5M
- (b) Write notes on ISDN service and its History. 5M

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

- 11 **Case Study: Designing Network Security and Privacy Measures** 10M
- Scenario: A healthcare organization needs to enhance the security and privacy of patient data transmitted across its network to comply with regulatory requirements.
- Problem Statement: As a network security specialist, your task is to design network security and privacy measures for the healthcare organization. Your solution should include:
- (i) Implementation of data encryption mechanisms to protect patient data during transmission.
 - (ii) Implementation of authentication and access control measures to restrict access to sensitive patient information.
 - (iii) Testing and validation of the network security and privacy measures to ensure compliance with healthcare industry regulations and standards.
