

MCA-14-32**COMPUTER NETWORKS AND DATA COMMUNICATION**

Maximum marks: 100 (External: 80, Internal: 20)

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introduction to Computer Networks and its uses; Network categorization and Hardware; Topologies; Network Software: Protocols, Services, Network Architecture, Design issues for the layers, OSI Reference model, TCP/IP Reference model, Comparison of OSI and TCP/IP Models. Introduction to Example Networks: Internet, ISDN, X.25, Frame Relay, ATM.

UNIT – II

Data Communication Model, Digital and Analog data and signals, Asynchronous and Synchronous transmission; bit rate, baud, bandwidth, Transmission impairment; Channel Capacity; Guided Transmission Media; Wireless transmission; Satellite communication.

Switching; Multiplexing; Spread Spectrum; local loop; Modems and ADSL; Encoding: NRZ, NRZ-I, Manchester and Differential Manchester encoding; Internet over Cable; ADSL Versus Cable; The Mobile Telephone System;

UNIT – III

Data Link Layer Design issues; Framing, Error Detection and Correction; Flow Control: Sliding Window Protocols; Medium Access Control: Aloha, CSMA protocols, Collision free protocols, Limited Contention Protocols; Wavelength Division Multiple access protocol, Wireless LAN Protocol: MACA; High Speed LANs; Ethernet LAN, Fast Ethernet, Gigabit Ethernet; Binary Exponential Backoff algorithm; Token Ring and FDDI; Introduction to Wireless LANs;

UNIT – IV

Network Layer Design issues , Virtual Circuit and Datagram Subnet, Routing Algorithms: Optimality principle, Shortest path Routing, Flooding , Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast and Multi Cast Routing, Routing for Mobile hosts, Congestion Control Algorithms: General Principals; Congestion control in Virtual – Circuit Subnets; Congestion Control in Datagram Subnets: Choke packets, Load Shedding; Random Early Detection, Jitter Control; Quality of Service: Over provisioning, Buffering, Traffic Shaping, Leaky bucket, token bucket, Resource Reservation, Admission Control, Packet Scheduling;

Text Books:

1. Andrew S. Tanenbaum, Computer Networks, 4th Edition - PHI.
2. Behrouz A Forouzan, Data Communications and Networking , 5th Edition- Tata Mc-Graw Hill.

Reference Books:

1. Michael A. Gallo, William M. Hancock, Computer Communications and Networking Technologies – CENGAGE learning.
2. William Stallings, Data and Computer Communications, 5th Edition – PHI.