

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks including subparts, if any.

OBJECTIVE:

This course covers theory and practice of data communication between computing devices. Topics include network architecture and topology, Basics of networking and protocols, OSI network layered models and Application layer protocols.

PRE-REQUISITE:

- Basic Networking
- Operating System Concepts

UNIT - I

Introductory Concepts: Goals and Applications of Networks, Network structure and architecture, the OSI reference model, services, networks topology.

Physical Layer: The Physical Layer, Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites Digital Signal Encoding Formats – NRZ-L, NRZI, bipolar-AMI, Manchester, Differential Manchester, Digital Modulation – ASK, FSK, PSK, PSK, Digitization – Sampling Theorem, PCM, DM, Analog Modulation – Introducing AM, FM, PM, The Mobile Telephone System. [No of Hrs.: 11]

UNIT - II

The Data Link Layer: Data Link Layer Design Issues, Error Detection and Correlation, Flow Control Protocols, Stop-and-wait Flow Control, Sliding – Window Flow Control, Error Control, Stop-and-wait ARQ, Go-back-N, Selective-repeat, Example of Data Link Protocols-HDLC

Medium access sub layer: Channel allocations, ALOHA Protocols, Carrier Sense Multiple Access Protocols, CSMA with Collision Detection, Collision free protocols, Ethernet, wireless LANs, Blue Tooth, Data Link Layer Switching. [No. of Hrs.: 11]

UNIT - III

Network Layer: Point-to-Point network, routing algorithms, congestion control, internetworking, Quality Control, Internetworking, The Network Layer in the Internet, IP packet, IP addresses, IPv6. [No of Hrs.: 10]

UNIT - IV

Transport Layer: Design Issue, connection management, TCP window management, User Datagram Protocol, Transmission Control Protocol, Performance Issues. **Application Layer:** DNS, Electronic Mail, WWW, MULTIMEDIA. **Network Security:** Cryptography and Compression Techniques. [No of Hrs.: 10]

TEXT BOOKS:

1. Forouzan, "Data Communication and Networking", TMH, 4th Edition.
2. A.S. Tanenbaum, "Computer Networks", PHI, 4th Edition.
3. W. Stallings, "Data and Computer Communication", Macmillan Press.
4. Comer, "Computer Networks and Internet", PHI.
5. Comer, "Internetworking with TCP/IP", PHI.

REFERENCES:

1. W. Stallings, "Data and Computer Communication", McMillan.
2. J. Martin, "Computer Network and Distributed Data Processing", PHI.
3. W. Stallings, "Local Networks", McMillan.
4. M.Schwartz, "Computer Communication Network Design and Analysis", PHI.
5. S. Keshav, "An Engineering Approach to Computer Networking, Pearson", 2001.