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Semester VI – Electronics Engineering Group (DE/EJ/ET/EN/EX/EQ)

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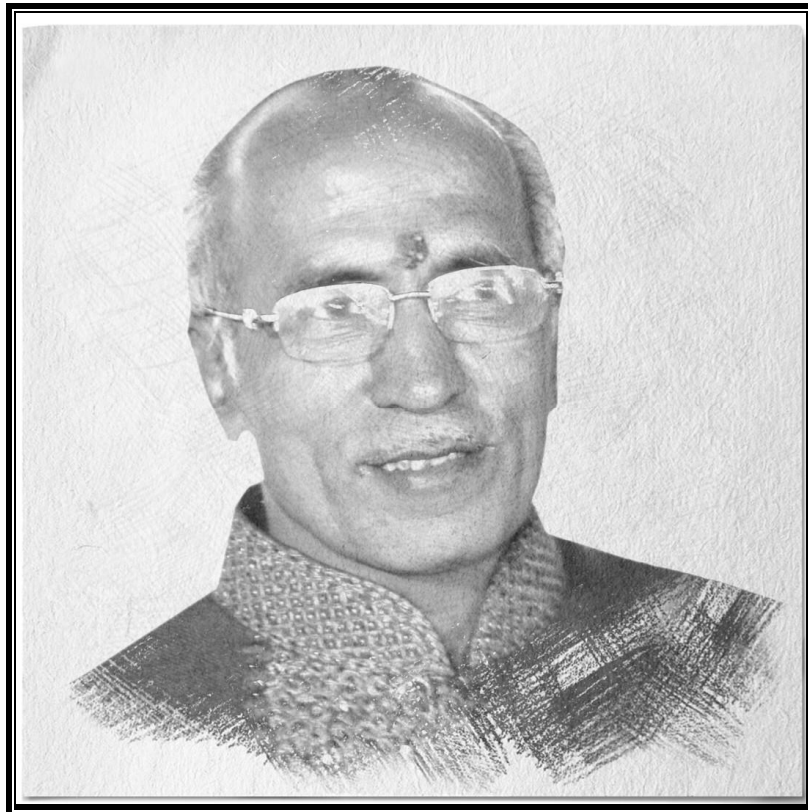
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*We dedicate this Publication soulfully and wholeheartedly,
in loving memory of our beloved founder director,
Late Shri. Pradeepji Lalchandji Lunawat,
who will always be an inspiration, a positive force and strong support
behind us.*



“My work is my prayer to God”

- Lt. Shri. Pradeepji L. Lunawat

*Soulful Tribute and Gratitude for all Your
Sacrifices, Hardwork, and 40 years of Strong Vision...*

Syllabus...

Computer Networking & Data Comm. : Sem. VI (Electronics Engineering Group (MSBTE))

Unit-I

Fundamentals of Data Communication and Network Topology :

Data communication and its characteristics, Components of data communication transmitter, Receiver, Medium, Message, protocol, Standards, Standard organizations, Basic block diagram of data communication system, Data transmission : Serial, Parallel synchronous, Asynchronous, Isochronous transmission, Transmission characteristics : Signaling rate, Data rate, Bit rate, Baud rate need of computer networks, Network criteria, Advantages of networking, Network topologies : Mesh, Star, Bus, Tree, Ring and Hybrid topologies schematic diagram, Working, Advantages disadvantages and applications, Network classification : Based on transmission technologies : Point to-point, Multipoint, Broadcast, Based on physical size (scale) : PAN, BAN, LAN, MAN, WAN, VPN, Based on architecture : Peer to peer, Client server, Advantages of client sever over peer-to-peer model. **(Refer Chapters 1 and 2)**

Unit-II

Network Models :

TCP/IP protocol suite with define protocols in respective layers : Physical layer, Data link layer, Network layer, Transport layer, Application Layer, Addressing in TCP/IP : Physical, Logical, Port and specific, The ISO-OSI model : Physical layer, Data link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer. **(Refer Chapter 3)**

Unit-III

Physical Layer :

Multiplexing : Basic concept, Frequency division multiplexing, Wavelength-division multiplexing, Synchronous time-Division multiplexing, Statistical time-division multiplexing, Transmission medium : Classification based on electromagnetic wave spectrum, Guided media : Twisted pair (UTP, STP) cable connector, Coaxial cable-connector, Fiber-optic cable-connector, Performance and applications, Unguided Media : Radio waves, Microwaves, Infrared and their applications, modems : Classifications : Broadband modem, DSL-ADSL, HDSL, VDSL, Switching : Circuit switched networks, Packet switched networks-datagram approach, Virtual circuit approach. **(Refer Chapters 4, 5 and 6)**

Unit-IV

Data Link Layer :

Data link layer : flow and error control, Error control : Types of errors : single bit and burst errors error detection and correction-hamming code, Linear block code, CRC, Checksum, Flow control : Framing, Flow and error control, Noiseless and Noisy channels stop-and-wait protocol, Stop and wait ARQ protocol. Sliding window protocol : One bit sliding window protocol, Go-back-N ARQ selective repeat ARQ. Point to point protocol : Service provided by PPP, Frame format PPP and transition phases of PPP. **(Refer Chapter 7)**

Unit-V

Network Transport and Application Layer :

Network devices : Repeater, Hub, Bridge, Switches, Router, Gateway, Network layer logical addressing : IPv4 addresses : Address space notations, Classful and classless addressing, Network address translation (NAT), IPv6 addresses, Need for IPv6, Structure and address space, Network layer multicast routing protocols : Unicast, Multicast and broadcast routing and applications transport layer : Process to process delivery, UDP, RTP and SCTP : ports, Format operation and uses, Application layer services : Concept of DNS, FTP Network security : Cryptography : it's components, Block diagram of symmetric and asymmetric cryptography security services : Concepts of message and entity security services, Firewall. **(Refer Chapters 8, 9, 10, 11, 12 and Appendix-A)**

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Unit – I

Chapter 1 : Fundamentals of Data Communication 1-1 to 1-12

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Unit – I

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