IT- 501 – Data Communication

Unit I Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise,Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product.

Unit II Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex,half duplex and fullduplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations-Point to point and point to multipoint configuration.

Unit III Telephone Network-Network topology, signaling- SS7,dial-up modems, modem standard, digital subscriber line – ADSL,SDSL,VDSL .Multiplexing,Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, pleisochronous digital hierarchy(PDH), synchronous digital hierarchy (SDH) ,STM -1 frame, virtual container, mapping of data signals on STM- 1.

Unit IV Switching techniques- Circuit , packet and hybrid switching, Types of error, single bit error, burst error, Error detection , Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check, error correction, Integrated services digital network, ISDN interface, ISDN devices, reference points ,ISDN services, ISDN Protocols

Unit V Transmission media-Guided and unguided media, twisted pair ,Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ- 45,Network interface card, rack, cable standard-Category 5,6,and 7,cross connection, straight connection cable coding standards.

References:-
1. "Data communication and networking", Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. **"**Computer Networks" - Tanenbaum ,PHI Learning.
4. "Communication Networks-Fundamental concepts and key Architectures",Leon Garcia,Widjaja,TMH\
5. "Computer Communications & Networking Technologies"-Michael A. Gallo & William M.
6. Hancock -Cengage pearsen publications
7. "Network for computer scientists & engineers" –Youlu zheng & shakil akhtar , Oxford pub.

Suggested List of Experiment
1. Case Study of digital interface RS-232
2. Case Study of Synchronous and asynchronous transmission
3. Case Study of various multiplexing techniques
4. Case Study of Parallel and serial transmission
5. ISDN implementation for internet
6. ISDN Devices
7. Study of SDH
8. Study of Network Interface Card
9. Study of twisted pair,coaxial cable and Fiber optic cableStudy of cross cable connection and straight cable connection
10. Study of digital subscriber line-ADSL for broadband connection
11. Study of NRZ and RZ Codes