ELECTRONICS & TELECOMMUNICATION ENGINEERING

(For both objective and conventional type papers)

PAPER - I

1. Materials and Components

Structure and properties of ElectricalEngineering materials; Conductors,Semiconductors and Insulators, magnetic,Ferroelectric, Piezoelectric, Ceramic,Optical and Super-conductingterials. Passive components andcharacteristics Resistors, Capacitorsand Inductors; Ferrities, Quartz crystalCeramic resonators, Electromagnetican Electromechanical components

.2. Physical Electronics, Electron Devicesand ICsectrons and oles in semiconductors,Carrier Statistics, Mechanism of currentflow in a semiconductor, Hall effect;Junction theory; ifferent types ofdiodes and their characteristics; BipolarJunction transistor; Field effect transistors;Power switching evices likeSCRs, CTOs, power MOSFETs; Basicsof ICs - bipolar, MOS and CMOStypes; basic of Opto Electronics.

3. ignals and Systems Classification of signals and systems:System modelling in terms of differentialand difference quations; Statevariable representation; Fourier series;Fourier representation; Fourier series;Fourier transforms and heir applicationto system analysis; Laplace transformsand their application to systemanalysis; Convolution and uperpositionintegrals and their applications; Ztransformsand their applications to theanalysis and characterisation of iscretetime systems; Random signalsand probability, Correlation functions;Spectral density; Response of linearsystem to random inputs.

4. **Network theory**Network analysis techniques; Networktheorems, transient esponse, teadystate sinusoidal response; Networkgraphs and their applications in networkanalysis; Tellegen's theorem.Two ort etworks; Z, Y, h and transmissionparameters. Combination oftwo ports, analysis of common twoports. Network unctions : parts of networkfunctions, obtaining a networkfunction from a given part. Transmissioncriteria : delay and ise time,Elmore's and other definitions effect ofcascading. Elements of network synthesis

.5. Electromagnetic heory Analysis of electrostatic and magnetostaticfields; Laplace's and Piossons'sequations; Boundary value problemsand their solutions; Maxwell's equations;application to wave propagationin bounded and unbounded media;Transmission lines : basic theory,standing waves, matching applica-Continued tions, misconstrue lines; Basics fwave guides and resonators; Elementsof antenna theory

.6. Electronic Measurements and instrumentation Basic oncepts, standards and erroranalysis; Measurements of basic electricalquantities and parameters; Electronicmeasuring instruments and theirprinciples of working : analog and digital,omparison, characteristics, pplication.Transducers; Electronic measurementsof non electrical quantities liketemperature, pressure, humidity etc;basics of telemetry for industrial use.

PAPER – II

1. Analog Electronic Circuits Transistor biasing and stabilization.Small signal analysis. Power amplifiers.Frequency response. Wide bandingtechniques. Feedback mplifiers.Tuned amplifiers. Oscillators. Rectifiersand power supplies. Op Amp PLL,other linear integrated circuits and pplications.Pulse shaping circuits andwaveform generators

2. Digital Electronic Circuits Transistor as a switching lement;Boolean algebra, simplification of Booleanfunctions, Karnaguh map and applications;IC Logic gates and theircharacteristics; IC logic families : DTL,TTL, ECL, NMOS, PMOS and CMOSgates and their comparison; ombinationallogic Circuits; Half adder, Fulladder; Digital comparator; MultiplexerDemultiplexer; ROM and their pplications.Flip flops. R-S, J.K, D and T flipflops;Different types of counters andregisters Waveform generators. A/Dand D/A converters. Semiconductormemories.

3. Control Systems Transient and steady state responseof control ystems; Effect of feedback on stability and sensitivity; Root locustechniques; Frequency responseanalysis. Concepts f gain and phasemargins: Constant-M and Constant-NNichol's Chart; Approximation of transientresponse from onstant-NNichol's Chart; Approximation of transientresponse from closed loop frequencyresponse; Design of ControlSystems, Compensators; Industrialcontrollers.

4. Communication Systems Basic information theory; odulationand detection in analogue and digitalsystems; Sampling and data reconstructions;Quantization & coding;Time division and frequency divisionmultiplexing; Equalization; OpticalCommunication : in free space & fiberoptic; Propagation of signals oat HF,VHF, UHF and microwave frequency;Satellite Communication

.5. Microwave ngineering Microwave Tubes and solid state devices,Microwave generation and amplifiers,Waveguides and other icrowaveComponents and Circuits, Misconstruecircuits, Microwave Antennas,Microwave Measurements, Masers,lasers; Microwave propagation.Microwave Communication Systemsterrestrial and Satellite based

.6. omputer ngineering Number Systems. Data representation;Programming; Elements of a high levelprogramming language ASCAL/C;Use of basic data structures; Fundamentalsof computer architecture; Processordesign; Control unit design;Memory organisation, I/o SystemOrganisation. Microprocessors : Architectureand instruction set of icroprocessors8085 and 8086, Assembly languageProgramming. MicroprocessorBased system design : typical xamples.Personal computers and theirtypical uses.