### II B.Tech (Electronics and Communication Engineering)

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**Total Credits** 28  
**Total Credits** 30
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Common to all Branches (w.e.f.2010 batch)

Unit I
Introduction to Managerial Economics:
Introduction to Managerial Economics & Demand Analysis: Definition of Managerial Economics, Characteristics and Scope – Managerial Economics and its relation with other subjects- Basic economic tools in Managerial Economics
Demand Analysis: Meaning- Demand distinctions- Demand determinants- Law of Demand and its exceptions.

Unit-II
Elasticity of Demand & Demand Forecasting: Definition -Types of Elasticity of demand - Measurement of price elasticity of demand: Total outlay method, Point method and Arc method- Significance of Elasticity of Demand.
Demand Forecasting: Meaning - Factors governing demand forecasting - Methods of demand forecasting (survey of buyers’ Intentions, Delphi method, Collective opinion, Analysis of Time series and Trend projections, Economic Indicators, Controlled experiments and Judgmental approach) - Forecasting demand for new products- Criteria of a good forecasting method.

Unit-III
Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs.- Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEP.

UNIT-IV
Unit V
Types of Industrial Organization & Introduction to business cycles: Characteristic features of Industrial organization, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, State/Public Enterprises and their types.
Introduction to business cycles: Meaning-Phases of business cycles- Features of business cycles.

Unit VI

Unit VII

Unit VIII
Capital and Capital Budgeting: Meaning of capital budgeting, Need for capital budgeting – Capital budgeting decisions (Examples of capital budgeting) - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), IRR and Net Present Value Method (simple problems)

Text Books:

References:
2. Suma Damodaran - Managerial Economics, Oxford 2011

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Electronic Devices and Circuits

Unit-I


Unit- II


Unit- III

Junction Diode Characteristics : Open circuited P N Junction, Forward and Reverse Bias, Current components in PN Diode, Diode Equation, Volt-Amper Characteristic, Temperature Dependence on V – I characteristic, Step Graded Junction, Diffusion Capacitance and Diode Resistance (Static and Dynamic), Energy Band Diagram of PN Diode,

Special Diodes: Avalanche and Zener Break Down, Zener Characteristics, Tunnel Diode, Characteristics with the help of Energy Band Diagrams, Varactor Diode, LED, PIN Diode, Photo Diode

Unit IV

Rectifiers and Filters: Half wave rectifier, ripple factor, full wave rectifier(with and without transformer), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, Π- section filter, Multiple L- section and Multiple Π section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

Unit- V

Transistors :

Junction transistor, Transistor current components, Transistor as an amplifier, Characteristics of Transistor in Common Base and Common Emitter Configurations, Analytical expressions for Transistor Characteristics, Punch Through/ Reach Through, Photo Transistor, Typical transistor junction voltage values.
Unit VI

Field Effect Transistors:

JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Introduction to SCR and UJT and their characteristics,

UNIT-VII

Transistor Biasing and Thermal Stabilization: Transistor Biasing and Thermal Stabilization: Operating point, Basic Stability, Collector to Base Bias, Self Bias Amplifiers, Stabilization against variations in $V_{BE}$, and $\beta$ for the self bias circuit, Stabilization factors, ($S$, $S'$, $S''$), Bias Compensation, Thermistor and Sensitor compensation, Compensation against variation in $V_{BE}$, $I_{co}$, Thermal runaway, Thermal stability

UNIT- VIII

Small signal low frequency Transistor models: Two port devices and the Hybrid model, Transistor Hybrid model, Determination of h-parameters from characteristics, Measurement of h-parameters, Conversion formulas for the parameters of three transistor configurations, Analysis of a Transistor Amplifier circuit using h-parameters, Comparison of Transistor Amplifier configurations

Text Books


Reference

1. Electronic Devices and Circuits – K Satya Prasad, VGS Book Links
5. Electronic Devices and Circuits -BV Rao, KBR Murty, K Raja Rajeswari, PCR Pantulu, Pearson, 2nd edition

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PROBABILITY THEORY AND STOCHASTIC PROCESSES

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


UNIT VI

UNIT VII


UNIT VIII


TEXT BOOKS:


REFERENCES:

NETWORK ANALYSIS

UNIT – I

UNIT – II
Network Topology: Definitions of branch, node, tree, planar, non-planar graph, incidence matrix, basic tie set schedule, basic cut set schedule. (Text Books: 2,3, Reference Books: 3)

UNIT – III

UNIT – IV
Coupled Circuits: Coupled Circuits: Self inductance, Mutual inductance, Coefficient of coupling, analysis of coupled circuits, Natural current, Dot rule of coupled circuits, Conductively coupled equivalent circuits- problem solving.
Resonance: Introduction, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, Condition for maximum impedance, current in anti resonance, Bandwidth of parallel resonance, general case- resistance present in both branches, anti resonance at all frequencies. (Text Books:2,3, Reference Books: 3)

UNIT – V
Network Theorems: Thevinin’s, Norton’s, Milliman’s, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens- problem solving using dependent sources also. (Text Books: 1,2,3, Reference Books: 2)
UNIT – VI
Two-port networks: Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h-parameters, Inverse h-parameters, Inverse Transmission line parameters, Relationship between parameter sets, Parallel connection of two port networks, Cascading of two port networks, series connection of two port networks, problem solving including dependent sources also. (Text Books: 1,2, Reference Books: 1,3)

UNIT – VII
Transients: First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation, Evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogeneous, problem solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots. Solutions using Laplace transform method. (Text Books: 1,2,3, Reference Books: 1,3)

UNIT – VIII
Filters: L.P.F, H.P.F, B.P.F, Band Elimination, All pass prototype filters design, M-derived filters of L.P. and H.P. filters only, Composite design of L.P. and H.P filters. (Text Books: 2, Reference Books: 1, 2,3)

TEXT BOOKS:
2. Network Analysis by K.Satya Prasad and S Sivanagaraju, Cengage Learning
3. Electric Circuit Analysis by Hayt and Kimmarle, TMH

REFERENCES:
2. Basic Circuit Analysis by DR Cunningham, Jaico Publishers.

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SIGNALS AND SYSTEMS

UNIT I
SIGNAL ANALYSIS: Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT II
FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS: Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet’s conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum

UNIT III
FOURIER TRANSFORMS: Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT IV
SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT V
CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval’s theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT VI
SAMPLING: Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.
UNIT VII
LAPLACE TRANSFORMS: Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T.’s, Relation between L.T.’s, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT VIII

TEXT BOOKS:


REFERENCES:


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ELECTRICAL TECHNOLOGY

UNIT I
DC MACHINES: Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators

UNIT II
D.C. MOTORS: DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne’s test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT III
TRANSFORMERS: Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit

UNIT IV
PERFORMANCE OF TRANSFORMERS: Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT V

UNIT VI

UNIT VII
SINGLE PHASE INDUCTION MOTORS: Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

UNIT VIII
ELECTRICAL INSTRUMENTS: Basic Principles of indicating instruments – Moving Coil and Moving iron Instruments (Ammeters and Voltmeters)
TEXT BOOKS:

REFERENCE BOOKS:
1. Basic Electrical Engineering by M.S. Naidu and S. Kamakshiah, TMH Publications


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ELECTRONIC DEVICES AND CIRCUITS LAB

PART A : (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 6 lab sessions):
1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Lowpower JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of
   • Multimeters (Analog and Digital)
   • Function Generator
   • Regulated Power Supplies
   1. Study and Operation of CRO.

PART B : (For Laboratory examination – Minimum of 10 experiments)

1. Frequency measurement using Lissajous Figures
2. PN Junction diode characteristics A. Forward bias B. Reverse bias (cut-in voltage & Resistance calculations)
3. Zener diode characteristics and Zener as a regulator
4. Transistor CB characteristics (Input and Output) & h Parameter calculations
5. Transistor CE characteristics (Input and Output) & h Parameter calculations
6. Rectifier without filters (Full wave & Half wave)
7. Rectifier with filters (Full wave & Half wave)
8. FET characteristics
9. SCR Characteristics
10. UJT Characteristics
11. CE Amplifier
12. CC Amplifier (Emitter Follower).
PART C:

Equipment required for Laboratories:

1. Regulated Power supplies (RPS) - 0-30v
2. CROs - 0-20M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Micro Ammeters (Analog or Digital) - 0-20 µA, 0-50µA, 0-100µA, 0-200µA
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V
9. Electronic Components - Resistors, Capacitors, BJT's, LCDs, SCR's, UJT's, FET's, LEDs, MOSFET's, diodes, transistors

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NETWORKS & ELECTRICAL TECHNOLOGY LAB

PART – A

2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.

3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.

4. Verification of Superposition and Reciprocity theorems.

5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.

6. Experimental determination of Thevenin’s and Norton’s equivalent circuits and verification by direct test.

7. Constant K - LP, HP, BP Filters

8. m derived filters

9. Composite Filters

PART – B

2. Swinburne’s Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).


4. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).

5. Brake test on 3-phase Induction motor (performance characteristics).

6. Regulation of alternator by synchronous impedance method
Electronic Circuit Analysis

Unit I

Single stage Amplifiers: Simplified Common Emitter hybrid model, simplified calculations for the common collector configuration and common base amplifier, Common emitter amplifier with emitter resistance, Emitter follower, Miller’s Theorem and dual of Miller’s theorem, FET small signal model, Low frequency common source and common drain amplifiers, FET as Voltage Variable Resistor, Biasing the FET

UNIT- II

Feedback Amplifiers: Classification of Amplifiers, Feedback concept, Transfer Gain with feedback, General characteristics of negative feedback amplifiers, Effect of Feedback on input and output Resistances, Method of Analysis of Feedback Amplifiers, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis

UNIT-III

Oscillators: Condition for oscillations. RC-phase shift oscillators with Transistor and FET with necessary derivation for frequency of oscillation, Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of oscillators, Negative Resistance in Oscillator

Unit IV


Unit V

High Frequency Transistor and FET Circuits: Transistor at High Frequencies, Hybrid- \( \pi \) Common Emitter transistor model, Hybrid \( \pi \) conductances, Hybrid \( \pi \) capacitances, Validity of hybrid \( \pi \) model, Variation of Hybrid Parameters, CE short circuit gain, Current gain with
resistive load, Single stage CE transistor amplifier response, Gain Bandwidth product, Emitter follower at High frequencies.

**FET:** Common Source amplifier at Higher Frequencies, and Common Drain Amplifier at High frequencies

**Unit VI**

**Power Amplifiers:** Class A large signal Amplifiers, Second harmonic Distortions, Higher order harmonic Distortion, Transformer Coupled Audio power amplifier, Efficiency, Push-pull amplifiers, Class B Amplifiers, Class AB operation, Efficiency of Class B Amplifier, Complementary Symmetry push pull amplifier, Class D amplifier, Class S amplifier, MOSFET power amplifier, Thermal stability and Heat sink

**Unit VII**

**Tuned Amplifiers:** Introduction, Q-Factor, Small Signal Tuned Amplifier – Capacitance single tuned amplifier, Double Tuned Amplifiers, Effect of Cascading Single tuned amplifiers on Band width, Effect of Cascading Double tuned amplifiers on Band width, Staggered tuned amplifiers, Stability of tuned amplifiers

**Unit VIII**

**Voltage Regulators:** Voltage regulation – Line Regulation, Load Regulation, Types of Regulators, Series voltage regulator, shunt regulators, Overload Voltage protection.

**Text Books:**


**References:**


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CONTROL SYSTEMS

Objective:
In this course it is aimed to introduce to the students the principles and applications of control systems in every day life. The basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

UNIT – I INTRODUCTION
Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems

UNIT II TRANSFER FUNCTION REPRESENTATION
Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples - Block diagram algebra – Representation by Signal flow graph - Reduction using mason’s gain formula.

UNIT-III TIME RESPONSE ANALYSIS

UNIT – IV
STABILITY ANALYSIS IN S-DOMAIN : The concept of stability – Routh’s stability criterion – qualitative stability and conditional stability – limitations of Routh’s stability Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT – V
FREQUENCY RESPONSE ANALYSIS : Introduction, Frequency domain specifications- Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.
UNIT – VI
STABILITY ANALYSIS IN FREQUENCY DOMAIN: Polar Plots, Nyquist Plots Stability Analysis.

UNIT – VII
CLASSICAL CONTROL DESIGN TECHNIQUES: Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

UNIT – VIII
State Space Analysis of Continuous Systems Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and it’s Properties – Concepts of Controllability and Observability

TEXT BOOKS:

REFERENCE BOOKS:

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Pulse and Digital Circuits

Unit I

Linear wave shaping: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, double differentiation, attenuators, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT II

Non-linear Wave Shaping: Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clamps.

Unit III

Switching Characteristics of Devices: Diode and Transistor as switches, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

Digital Logic gate circuits: Realization of Logic Gates using DTL, TTL, ECL and CMOS logic circuits, Comparison of logic families

Unit IV

Multivibrators: Analysis & Design of Bistable Multivibrators: Fixed bias & self biased transistor binary, Commutating capacitors, Triggering in binary, Schmitt trigger circuit, Applications

UNIT V

Multivibrators(Cotnd.): Analysis & design of Monostable Multivibrator: Collector-coupled and Emitter-coupled Monostable multivibrators, Triggering in monostable multi;

Analysis & design of Astable multivibrator (Collector coupled and Emitter-coupled) using transistors.
UNIT VI

Time Base Generators

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators.

Unit VII

Synchronization and Frequency Division: Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, Monostable relaxation circuits, Phase delay & phase jitters; Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

Unit VIII

Blocking oscillators & Sampling Gates:

Blocking oscillators: Monostable blocking oscillators (Base timing & Emitter timing): Astable blocking oscillators (Diode-Controlled & RC controlled), Applications.

Sampling gates: Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Four-diode sampling gates; Applications of sampling gates.

Text Books:


References:


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SWITCHING THEORY AND LOGIC DESIGN

UNIT I: Review of Number systems:

Representation of numbers of different radix, conversion of numbers from one radix to another radix, r-1’s complement and r’s complement of unsigned numbers subtraction, problem solving. Signed binary numbers, different forms, problem solving for subtraction. 4-bit codes: BCD, EXCESS 3, alphanumeric codes, 9’s complement, 2421, etc. (Text Books: 1,2, Reference Books: 1,2,4)

UNIT II

Logic operation, error detection and correction codes: Basic logic operations NOT, OR, AND, Boolean theorems, Complement and dual of logical expressions, NAND and NOR Gates, EX-OR, EX-NOR Gates, standard SOP and POS, Minimisation of logic functions using theorems, Generation of self dual functions, Gray code, error detection and error correction codes, parity checking even parity, odd parity, Hamming code, multi leveled AND-NOR Realisations. Two level NAND-NAND and NOR-NOR realizations. Degenerative forms and multi level realizations. (Text Books: 1,2, Reference Books: 1,2,4)

UNIT III

Minimisation of switching functions: Minimisation of switching functions using K-Map up to 6-variables, Tabular minimization, minimal SOP and POS Realisation. Problem solving using K-map such as code converters binary multiplier etc., (Text Books: 1,2, Reference Books: 2,4)

UNIT IV

Combinational logic circuits-I: Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary adder, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit Excess3 adder circuit, look-a-head adder circuit. (Text Books: 2, Reference Books: 1,2,3)

UNIT V

Combinational logic circuits-II: Design of decoder, Demultiplexer, higher order demultiplexing, encoder, multiplexer, higher order multiplexer, realization of Boolean functions using decoders and multiplexers, priority encoder, different code converter using full adders. (Text Books: 1,2, Reference Books: 1,2,3)

UNIT VI

Combinational logic circuits-III: PROM, PLA, PAL, realization of switching functions using PROM, PLA and PAL; comparison of PROM, PLA and PAL, Programming tables of PROM, PLA and PAL. (Text Books: 1,2, Reference Books: 1,2,4)
UNIT VII


UNIT VIII

Sequential circuits II: Finite state machine, capabilities and limitations, analysis of clocked sequential circuits, design procedures, reduction of state tables and state assignment. Realization of circuits using various flip-flops. Mealey to Moore conversion and vice-versa. (Text Books: 1 Reference Books: 1,2,4)

TEXTBOOKS:

1. Switching theory and logic design by Hill and Peterson Mc-Graw Hill MH edition
2. Modern Digital Electronics by RP Jain, TMH.

Reference Books:

2. Digital design by Mano 2nd edition PHI.
EM WAVES AND TRANSMISSION LINES

Review of Coordinate Systems, Vector Calculus:

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V

UNIT V


UNIT VII


UNIT VIII


TEXT BOOKS:


REFERENCES:


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ANALOG COMMUNICATIONS

UNIT I

INTRODUCTION: Introduction to communication system, Need for modulation, Frequency Division Multiplexing, Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector.

UNIT II

DSB MODULATION: Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.

UNIT III


UNIT IV


UNIT V


UNIT VI

UNIT VII


UNIT VIII

PULSE MODULATION : Time Division Multiplexing., Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM, TDM Vs FDM

TEXT BOOKS:

REFERENCES:

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ELECTRONIC CIRCUITS & P D C LAB

List of Experiments (Twelve experiments to be done):

I) Design and Simulation in Simulation Laboratory using Multisim OR Pspice OR Equivalent Simulation Software, & Verifying the result by Hardware (Any Six):

1. Common Emitter and Common collector amplifier-Freq. response, Impedances measurement
2. Two Stage RC Coupled Amplifier
3. Current shunt and Voltage shunt Feedback Amplifier- Freq. response, Impedances measurement (with and without feedback)
4. Wien Bridge Oscillator using Transistors- Design for different frequencies
5. RC Phase Shift Oscillator using Transistors - Design for different frequencies
6. Class A Power Amplifier (with and without transformer load)
7. Class B Power Amplifier
8. Single Tuned Voltage Amplifier
9. Series Voltage Regulator
10. Shunt Voltage Regulator

II) Pulse and Digital Circuits (Any Six)- By designing the Circuit

1. Linear wave shaping (Diff. Time Constants, Differentiator, Integrator)
2. Non Linear wave shaping – Clippers, Clampers
3. Logic gates with discrete components (Diodes, Transistors)
4. Bistable Multivibrator
5. Astable Multivibrator (Voltage-Frequency convertor)
7. Schmitt Trigger.
8. UJT Relaxation Oscillator.
10. Sampling Gates

Equipments required for Laboratories:

i. For software simulation of Electronic circuits
   i) Computer Systems with latest specifications
   ii) Connected in Lan (Optional)
   iii) Operating system (Windows XP)
   iv) Simulations software (Multisim/TINAPRO) Package

Equipment:

1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multimeters
ANALOG COMMUNICATIONS LAB

List of Experiments (Twelve experiments to be done) - (a. Hardware, b. MATLAB Simulink, c. MATLAB Communication tool box)

A. Amplitude Modulation - Mod. & Demod.
B. AM - DSB SC - Mod. & Demod.
C. Spectrum Analysis of Modulated signal using Spectrum Analyser
D. Diode Detector
E. Pre-emphasis & De-emphasis
F. Frequency Modulation - Mod. & Demod.
G. AGC Circuits
H. Sampling Theorem
I. Pulse Amplitude Modulation - Mod. & Demod.
J. PWM, PPM - Mod. & Demod.
K. PLL

Equipments & Software required:

Software:

i.) Computer Systems with latest specifications
ii) Connected in Lan (Optional)
iii) Operating system (Windows XP)
iv) Simulations software (Simulink & MATLAB)

Equipment:

1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multimeters
6. Spectrum Analyser

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