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II B.Tech. I Semester

10BT3BS03: SPECIAL FUNCTIONS AND COMPLEX ANALYSIS
(Common to ECE, EEE, EIE & EConE)

UNIT-I : Partial Differential Equations

UNIT-II : Special Functions
Euler's Integrals - Beta and Gamma functions - properties - Relationship between beta and gamma functions- applications - evaluation of improper integrals using Beta and Gamma functions
Bessel function: Generating function-properties of Bessel functions - recurrence relations-Orthogonality.

UNIT-III : Limits and Continuity - Analytic Functions
Exponential, Trigonometric, logarithmic, Hyperbolic and general power ($Z^c$) - separation of real and imaginary parts - Limits and Continuity of functions. Differentiability - Analyticity - Cauchy Riemann equations- conjugate and harmonic conjugate functions - Milne Thompson method- potential functions.

UNIT-IV : Complex Integration

UNIT-V : Complex Power Series
Taylor theorem (with proof) - Laurent's theorem (without proof) - Taylor and Laurent’s series expansions of complex functions - Singularities - types - residues - poles of order m.

UNIT-VI : Residue Calculus
Residue theorem - proof - applications - evaluation of integrals using residue theorem - evaluation of improper and real integrals of the type

\[ \int_{-\infty}^{\infty} f(x)dx \quad \text{i)} \quad \int_{0}^{2\pi} f(\cos \theta, \sin \theta) d\theta \quad \text{ii)} \quad \int_{-\infty}^{\infty} e^{imx} f(x)dx \quad \text{iii)} \]
UNIT-VII: Rouche’s Theorem - Applications

UNIT-VIII: Conformal Mapping
Definitions and examples, Mappings defined by $w = e^z$, $\ln z$, $z^2$, $\sin z$, $\cos z$. Translation, Rotation, Inversion and Bilinear transformation - properties - fixed point - cross ratio - invariance of circles under bilinear transformation - determination of bilinear transformation using three given points.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I: PN Junction Diode

UNIT-II: Rectifiers, Filters and Regulators
Halfwave rectifier and fullwave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter, π - section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

UNIT-III: Bipolar Junction Transistor
Transistor construction, BJT Operation, Transistor as an amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in Common Emitter, Common Base and Common Collector Configurations, BJT specifications.

UNIT-IV: Transistor Biasing and Stabilization
Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in $V_{BE}$ and $\beta$, Bias Compensation Using Diodes and Transistors, Thermal Runaway, Condition for Thermal Stability in CE configuration, Problems on biasing circuits.

UNIT-V: Small Signal Analysis of BJT Amplifiers
BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using h-Parameters, Comparison of CB, CE and CC configurations, Simplified Hybrid Model, Millers Theorem, Dual of Millers Theorem.

UNIT-VI: Field Effect Transistor
Construction, Principle of Operation and Characteristics of JFET and MOSFET (Enhancement & Depletion), Small Signal Model of JFET & MOSFET.
UNIT-VII: FET Amplifiers
Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, FET as Voltage Variable Resistor, Comparison between BJT and FET.

UNIT-VIII: Special Purpose Electronic Devices

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I : Fundamentals of Electrical Circuits
Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchoff Laws, current division and voltage division rules, network reduction techniques, series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

UNIT-II : Basic Nodal & Mesh Analysis
Basic definitions: node, path, loop, branch, nodal analysis and super node concept, mesh analysis and super mesh concept - problems.

UNIT-III : Fundamentals of AC Circuits
Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, amplitude, determination of average and RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

UNIT-IV : Single Phase AC Circuits

UNIT-V : Transient Analysis

UNIT-VI : Magnetically Coupled Circuits
Coupled circuits, self & mutual inductance, DOT conventions, coefficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.
UNIT-VII : Network Theorems - I
Thevenin's, Norton's, Maximum power transfer and Superposition theorems for DC and sinusoidal excitations - applications.

UNIT-VIII : Network Theorems - II
Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation - applications.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I: Number Systems & Codes
Philosophy of number systems – complement representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

UNIT-II: Boolean Algebra and Switching Functions
Fundamental postulates of Boolean Algebra, Basic theorems and properties, switching functions, Canonical and Standard forms, algebraic simplification, digital logic gates, properties of XOR gate, universal gates, Multilevel NAND/NOR realizations.

UNIT-III: Minimization of Switching Functions
Map method, Prime implicants, Don’t care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

UNIT-IV: Combinational Logic Design

UNIT-V: Programmable Logic Devices, Threshold Logic
Basic PLD’s-ROM, PROM, PLA, PAL, Realization of Switching functions using PLD’s. Capabilities and limitations of Threshold gate, synthesis of threshold functions, multigate synthesis.

UNIT-VI: Sequential Circuits - I
Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples),Basic flip-flops, Triggering and excitation tables, Steps in synchronous sequential circuit design, Design of Synchronous counters – modulo-N, up/down counter, ring counter, Johnson counter, Design of Asynchronous counter-modulo-N , Sequence detector, Serial binary adder.
UNIT-VII: Sequential Circuits - II
Finite state machine-capabilities and limitations, Mealy and Moore models, minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods, concept of minimal cover table.

UNIT-VIII: Algorithmic State Machines
Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control implementations, examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. I Semester

10BT31001: THERMODYNAMICS AND FLUID MECHANICS

UNIT-I: Laws of Thermodynamics
Basic concept, Thermodynamic systems and processes, Zeroth law of Thermodynamics: Concept of temperature, First law of Thermodynamics: Concept of internal energy and enthalpy, applications to open and closed systems, Second law of Thermodynamics: Concept of entropy.

UNIT-II: Thermodynamic Air Cycles and Air Compressors


UNIT-IV: Refrigeration and Heat Transfer
Basic concepts of refrigeration, Various methods of producing refrigerating effects, Air conditioning process. Basic concepts of Heat Transfer, One dimensional heat conduction: Plain wall and composite walls, Basic concept of Radiation.

UNIT-V: Basic Concepts of Fluid Mechanics

UNIT-VI: Analysis of Flow of Fluids
Stream line, path line and streak lines and stream tube, classification of various fluid flows, Equation of Continuity for one dimensional flow, Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its applications on force on pipe bend, Flow measuring devices and its basic problems.
UNIT-VII: Dimensional and Model Analysis
Introduction, Dimensions, Dimensional Homogeneity, Methods of Dimensional analysis, Model analysis introduction, Similitude, Dimensionless Numbers and their significance, Model or Similarity laws.

UNIT-VIII: Hydraulic machines
Pumps: Basic concepts, Classifications, Working principles of Centrifugal and Reciprocating pumps.
Turbines: Basic concepts, Classifications, Working Principles of various turbines, efficiencies, basic problems.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I: Signal Analysis
Signal definition, classification of signals, basic operations on signals, 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
System definition, classification of 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: 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-VII: 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-VIII: Z–Transforms

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. I Semester
10BT30411: SEMICONDUCTOR DEVICES AND CIRCUITS LAB
(Common to ECE, EIE & EConE)

L T P C
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PART A: (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 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, PCBs.

2. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIAC, TRIAC, Linear and Digital ICs.

3. Study and operation of
   · Multimeters (Analog and Digital)
   · Function Generator
   · Regulated Power Supplies
   · CRO.

PART B: (Minimum of 10 experiments to be conducted)

1. Forward and Reverse bias characteristics of PN Junction diode.

2. Zener diode characteristics and Zener as Voltage Regulator.

3. Input and Output characteristics of Transistor in CB Configuration.

4. Input and Output characteristics of Transistor in CE Configuration.

5. Half wave Rectifier With and without filters.

6. Full wave Rectifier With and without filters.

7. FET characteristics.


12. SCR Characteristics.

13. UJT Characteristics.
List of Experiments:

1. Basic Operations on Matrices.
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, Sinc function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd Parts of Signal or Sequence and Real and Imaginary Parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
12. Locating Zeros and Poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
17. Verification of Weiner-Khinchine Relations.
UNIT-I: Introduction
Concepts of Control Systems, Open Loop and closed loop control systems, Feed-Back Characteristics, Effects of feedback, Block diagram representation of physical systems, Mathematical models-differential Equations.

UNIT-II: Transfer Function Representation
Analogous systems, electrical analogy of physical systems, Derivation of transfer function, Transfer function of DC Servo motor, Synchro transmitter and receiver, Block diagram algebra, Signal Flow graph and Mason's gain formula.

UNIT-III: Time Response Analysis
Types of test signals, Response of first and second order system, Time domain specifications, type and order of systems, steady state error, static error constants, generalized error co-efficients. Effect of P, PI, PID on time response.

UNIT-IV: Stability Analysis in S-Domain
Root Locus Technique: 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 in frequency domain using Nyquist stability criterion, simple problems.
UNIT-VII: Design and Compensation of Control Systems
Introduction to Compensation networks, Lag, Lead, lead-lag compensation, Compensation using Bode plots.

UNIT-VIII: State Space Analysis of Continuous Systems Concepts of state, state variables and state model, derivation of state model for physical systems Diagonalization, State Transition Matrix and its Properties, Solution of linear state equation, Concepts of Controllability and Observability, Kalman's test only.

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. II Semester

10BT41001: ELECTRICAL AND ELECTRONIC MEASUREMENTS

UNIT-I: Ammeters and Voltmeters

UNIT-II: Ohmmeters and Potentiometers
Series ohmmeter, shunt ohmmeter, multimeters. DC Potentiometers: Basic potentiometer circuit, standardization, Compton's Potentiometers, applications. AC Potentiometers: Standardization, Polar types and Coordinate types, applications.

UNIT-III: Power, Power Factor & Energy Meters
Construction, working principle and expression of torque equation for single phase electrodynamowattmeter, single phase electrodynamo power factor meter and single phase induction energy meter. Testing of energy meter by direct loading, Phantom loading methods.

UNIT-IV: Bridges

UNIT-V: Electronic Instruments
AC voltmeter using rectifiers, true RMS reading Voltmeter, electronic multimeter, digital voltmeters: ramp DVM, staircase ramp DVM, dual slope DVM and successive approximation DVM.

UNIT-VI: Frequency and Time Measurements
UNIT-VII: Oscilloscopes
Motion of electron in electric and magnetic fields, electrostatic and magnetic focusing, deflection sensitivity in both cases, CRO operation, CRT characteristics, CRO probes, Time base sweep modes, Trigger generator, Vertical amplifier, modes of operations, A, B, alternate & chop modes. Sampling oscilloscopes, storage oscilloscope. Standard specifications of CRO, synchronous selector circuits, Lissajous figures.

UNIT-VIII: Analyzers and Recorders
Spectrum analyzers, different types of spectrum analyzer, recorders, introduction to magnetic recording techniques & X-Y plotters. Display devices and display systems, logic analyzers.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I: Introduction to Measurement and Transducers

UNIT-II: Performance Characteristics
Static characteristics: Calibration, accuracy, precision, sensitivity, linearity, resolution, hysteresis, threshold, reproducibility, repeatability, dead space, span, range.
Dynamic characteristics: Generalized mathematical model of measurement system. Zero order, first order and second order measurement systems and their response to Step, Ramp and Impulse inputs. Frequency response of first order and second order systems.

UNIT-III: Resistive Transducers
Potentiometers, strain gauges and their types, resistance temperature detector, thermistor, light dependent resistors.

UNIT-IV: Inductive Transducers
Variable reluctance, eddy current, linear variable differential transformers, electromagnetic, synchros, resolvers & inductosyn, magnetoelastic and magnetostrictive.

UNIT-V: Capacitive Transducers
Variable and differential dielectric, variable and differential gap between the plates, variable and differential area, frequency response, measurement of humidity, liquid level, displacement and pressure.

UNIT-VI: Self-Generating Transducers
Thermoelectric transducers, Piezoelectric transducers, Pyroelectric transducers, Photovoltaic transducers, force-balance transducers.
UNIT-VII: Signal Conditioning
Block diagram of signal conditioning, balance and deflection measurement in Wheatstone bridge, measurement of reactance: Push-pull bridge and Blumein bridge. Carrier amplifier, chopper amplifier, low drift amplifier and charge amplifier.

UNIT-VIII: Digital and other Transducers
Position encoders, Transducer based on semiconductor junctions: Thermometers, magnetodiodes & magnetotransistors, photodiodes & phototransistors. Fiber-optic transducers, ultrasonic transducers. MEMS and Nanosensors.

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. II Semester

10BT40401: ELECTRONIC CIRCUIT ANALYSIS  
(Common to ECE, EIE & EConE)

UNIT-I: Single Stage Amplifiers

UNIT-II: Multi Stage Amplifiers
Analysis of Cascaded RC Coupled BJT Amplifiers, Cascode Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers – RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers.

UNIT-III: BJT Frequency Response
Logarithms, Decibels, General Frequency Considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and Bypass Capacitors, The Hybrid – \( \pi \) Common Emitter Transistor Model, CE Short Circuit Current Gain, Current Gain with Resistive Load, Single Stage CE Transistor Amplifier Response, Gain – Bandwidth product, Emitter Follower at Higher Frequencies.

UNIT-IV: MOSFET Amplifiers
Basic Concepts, MOSFET Small Signal Model, Common Source Amplifier with Resistive Load, Diode Connected Load and Current Source Load, Source Follower, Common gate stage cascode and folded cascode amplifier and their Frequency Response.

UNIT-V: Feedback Amplifiers
UNIT-VI: Oscillators
Conditions for oscillations, RC and LC Type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized Analysis of LC Oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase Shift and Wien-Bridge Oscillators.

UNIT-VII: Large Signal Amplifiers

UNIT-VIII: Tuned Amplifiers

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. II Semester
10BT40221: PRINCIPLES OF ELECTRICAL ENGINEERING
(Common to ECE, EIE & EConE)

UNIT-I : Two Port Networks
Impedance parameters, admittance parameters, hybrid parameters, transmission (ABCD) parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, interconnection of two port networks in series, parallel and cascaded configurations, image parameters, illustrative problems.

UNIT-II : Filters
Classification of filters, filter networks, classification of pass band and stop band, characteristic impedance in the pass band & stop bands, constant-k Low pass filter, high pass filter, m-derived T-section, band pass filter and band elimination filter, illustrative problems.

UNIT-III : Symmetrical Attenuators
Symmetrical attenuators, T-type attenuator, \( \Pi \)-type attenuator, bridged T type attenuator, lattice attenuator.

UNIT-IV : DC Machines
Principle of operation of DC Machines- constructional features, EMF equation, Types of DC machines, Magnetization and load characteristics of DC generators, characteristics of DC motors, losses and efficiency, Swinburne's test, Speed control: flux and armature voltage control of DC shunt motor.

UNIT-V : Poly Phase System
Advantages of poly phase system over single phase system - phase sequence - star & delta connections, relationship between phase and line quantities, balanced and unbalanced circuits, power measurement in three phase systems using two wattmeter method - problems.

UNIT-VI : Transformers and their Performance
Principle of operation of single phase transformer, types, constructional features, phasor diagram on No load and load, equivalent circuit, losses and efficiency of transformer and regulation, OC and SC tests, predetermination of efficiency and regulation (simple problems).
UNIT-VII : Three Phase Induction Motors and Alternators
Principle of operation of three phase induction motors, slip ring and squirrel cage motors, alternators: constructional features, principle of operation, types, EMF equation (simple problems).

UNIT-VIII : Special Machines
Principle of operation - shaded pole motors, capacitor motors, AC servomotor, AC tachometers, synchros, stepper motor - characteristics.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I: Linear Wave Shaping
High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High pass RC network as differentiator and Low pass RC network as integrator, attenuators and its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit. Problem solving.

UNIT-II: Non-Linear Wave Shaping
Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Synchronized clamping.

UNIT-III: Switching Characteristics of Devices
Diode as a switch, piecewise linear diode characteristics, Diode switching times, Transistor as a switch, Break down voltages, transistor in saturation, temperature variations of saturation parameters, Transistor-switching times, Silicon-controlled-switch circuits.

UNIT-IV: Multivibrator Circuits
Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger Circuit using BJT, Concept of triggering, Symmetrical and asymmetrical configurations.

UNIT-V: 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, Transistor Current time base generators, Methods of linearity improvements.

UNIT-VI: SAMPLING GATES
Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling gate, Reduction of pedestal in gate circuits, Six diode gate, Applications of sampling gates.
UNIT-VII: Synchronization and Frequency Division
Principles of Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT-VIII: Realization of Logic Gates using Diodes & Transistors
AND, OR & NOT gates using Diodes & Transistors, DCTL, RTL, DTL, TTL and CMOS Logic families, Comparison between the logic families.

TEXT BOOKS:

REFERENCE BOOKS:
II B.Tech. II Semester
10BT40231: ELECTRICAL ENGINEERING LAB
(Common to ECE, EIE & EConE)

Any SIX experiments from each part to be conducted

PART - A

1. Series and parallel resonance - timing, resonant frequency, bandwidth and Q-factor determination for RLC network
2. Time response of first order RL/RC network for periodic non-sinusoidal inputs - time constant and steady state error determination
3. Two port network parameters - Z and Y parameters
4. Two port network parameters - ABCD and h-parameters
5. Verification of Superposition and Reciprocity theorems
6. Verification of maximum power transfer theorem. Verification on both DC and AC
7. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test
8. Constant - k low pass filter and high pass filter - design and test

PART - B

1. Magnetization characteristics of DC shunt generator. Determination of critical filed resistance
2. Swinburne's test on DC shunt machine (Predetermination of efficiency of a given DC shunt machine working as motor and generator)
3. Brake test on DC shunt motor. Determination of performance characteristics
4. Speed control of DC motor by
   a. Field flux control method
   b. Armature voltage control method
5. OC and SC tests on single-phase transformer (predetermination of efficiency and regulation at given power factors and determination of equivalent circuit)
6. Load test on single phase transformer
7. Brake test on three-phase induction motor. Determination of performance characteristics
II B.Tech. II Semester
10BT40411: ELECTRONIC CIRCUITS LAB
(Common to ECE & EIE)

L T P C
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List of Experiments: (Minimum of Twelve experiments to be conducted)

I) Design and Simulation in Simulation Laboratory using Any Simulation Software.
(Minimum of Six Experiments to be conducted):

1. Common Emitter amplifier
2. Common Source amplifier
3. A Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier

II) Testing in the Hardware Laboratory:
Any Three circuits simulations in Simulation laboratory
Any Three of the following
   Class A Power Amplifier (with transformer load)
   Class C Power Amplifier
   Single Tuned Voltage Amplifier
   Hartley and Colpitt’s Oscillators
   Darlington Pair
   MOSFET Amplifier
II B.Tech. II Semester

10BT4HS02: ADVANCED ENGLISH COMMUNICATION SKILLS
(Audit Course)
(Common to ECE, EEE, EIE, EConE & BOT)

UNIT-I: Vocabulary Building
Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.
Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT-II: Reading Comprehension
Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT-III: Academic Essay Writing
Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

UNIT-IV: Technical Report Writing
Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

UNIT-V: Career Skills
Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.
UNIT-VI: Resume Writing
Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT-VII: Group Discussion
Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

UNIT-VIII: Interview Skills
Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

REFERENCE BOOKS:

SUGGESTED SOFTWARE:
1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.