**TAS 301**

## MATHEMATICS-III

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**Unit - I : Integral Transforms** **8**

Fourier integral, Fourier complex transform, Fourier sine and cosine transforms and applications to simple heat transfer equations.

Z – transform and its application to solve difference equations.

**Unit - II : Functions of a Complex Variable - I** **9**

Analytic functions, C-R equations and harmonic functions, Line integral in the complex plane, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic functions, Liouvilles theorem, Fundamental theorem of algebra.

**Unit - III : Functions of a Complex Variable - II** **8**

Representation of a function by power series, Taylor's and Laurent's series, Singularities, zeroes and poles, Residue theorem, evaluation of real integrals of type $\int_o^{2\pi} f(\cos\theta, \sin\theta)\, d\theta$ and $\int_{-\infty}^{+\infty} f(x)\, dx$, Conformal mapping and bilinear transformations.

**Unit - IV : Statistics and Probability** **8**

Moments, Moment generating functions, Skewness, Kurtosis,Correlation and Regression, Binomial distribution, Poisson distribution, Normal distribution.

**Unit - V : Curve Fitting and Solution of Equations** **5**

Method of least squares and curve fitting of straight line and parabola, Solution of cubic and bi-quadratic equations.

**TEE 303**

## NETWORK ANALYSIS AND SYNTHESIS

| L | T | P |
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**Unit – I :**

**Graph Theory** : Graph of a Network, definitions, tree, co tree , link, basic loop and basic cut set, Incidence matrix, cut set matrix, Tie set matrix Duality, Loop and Node methods of analysis.

7

**Unit – II :**

**Network Theorems (Applications to ac networks):** Super-position theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Reciprocity theorem. Millman's theorem, compensation theorem, Tellegen's theorem.

5

**Unit – III :**

**Network Functions :**

Concept of Complex frequency , Transform Impedances Network functions of one port and two port networks, concept of poles and zeros, properties of driving point and transfer functions, time response and stability from pole zero plot, frequency response and Bode plots.

9

**Unit – IV :**

**Two Port Networks**:

Characterization of LTI two port networks ZY, ABCD and h parameters, reciprocity and symmetry. Inter-relationships between the parameters, inter-connections of two port networks, Ladder and Lattice networks. T & ∏ Representation.

7

**Unit – V :**

**(a) Network Synthesis :**

Positive real function; definition and properties; properties of LC, RC and RL driving point functions, synthesis of LC, RC and RL driving point immittance functions using Foster and Cauer first and second forms.

**(b) Filters :**

Image parameters and characteristics impedance, passive and active filter fundamentals, low pass, highpass,band pass, band elimination filters.

9

**Text Books:**


1. M.E. Van Valkenburg," Network Analysis", Prentice Hall of India
2. D.Roy Choudhary,"Networks and Systems" Wiley Eastern Ltd.
3. Donald E. Scott : "An Introduction to Circuit analysis: A System Approach" McGraw Hill Book Company.
4. A.Chakrabarti,"Circuit Theory" Dhanpat Rai & Co.


**Reference Books :**


5. M.E. Van Valkenburg,"An Introduction to Modern Network Synthesis",Wiley Eastern Ltd.
6. W.H. Hayt & Jack E-Kemmerly, Engineering Circuit analysis" Tata McGraw Hill.
7. Soni, Gupta ,"Circuit Analysis", Dhanpat Rai & Sons.
8. Ram Kalyan, Linear Circuits Oxford University Press.

**TEC-301**

## SOLID-STATE DEVICES AND CIRCUITS

| L | T | P |
|---|---|---|
| 3 | 1 | 0 |

**Unit-I : Special Diodes**

LED, Varactor, Photodiode, Schotkey barrier, tunnel diodes and their constructions and characteristics.

**Bipolar Junction Transistors :** Transistor as an amplifier, small signal Equivalent circuits (Hybrid-pi, Ebers moll), Graphical Analysis, biasing the BJT for discrete-circuit design,

**Unit-II :**

Basic Single Stage BJT amplifier configurations transistor as a switch-cut off & saturation, complete static characteristics, Internal capacitances and second order effects Field Effect transistor-Structure and physical operation of Enhancement and depletion types MOSFET, I/V characteristics, MOSFET circuits at DC, MOSFET as an amplifier, biasing in MOS amplifier circuits, Basic configurations of single stage MOS amplifier, Internal capacitances of MOSFETS.

**Unit-III : Frequency Response**

S-Domain analysis, amplifier transfer function, Low and high frequency response of common source and common emitter amplifiers, common base & common gate cascade configurations, Frequency response of source followers, CC-CE cascade.

**Unit-IV : Feed Back**

General feed back structure, properties of negative feed back, four basic feed back topologies sedries shunt; series-series; shunt-shunt; & shunt-series feedback amplifier, determination of Loop gain, stability problem.

**Unit-V : Oscillators**

Basic principles of sinusoidal oscillator, RC oscillators: Weinbridge and phases half tuned oscillators: Collptts, Hartley and Clap. Crystal Oscillators.

**Text book:**


1. A.S. Sedra and K.C. Smith, “Microelectronic circuits”, Oxford University Press (India).
2. B.P. Singh & R. Singh, Electronics Devices & Integrated Circuits, Pearson.


**Reference Book**


1. Millman, J. and Grabel, A./”Microelectronics”/McGraw Hill.
2. Bell, David A/ “Electronic Devices & Circuits”/Prentice Hall (India)4th Edition.
3. Nair, B. Somanathan /”Electronics Devices & Applications”/Prentice-Hall (India)
4. Neamen, Donald A./ “Electronic Circuit Analysis & Design”/Tata McGraw Hill.
5. Neamen, Donald A./”Semiconductor Physics & Devices”/Tata McGraw Hill.
6. Sedra, “Micro Electronics Circuits” Oxford University Press.


**TEC-302**

## SWITCHING THEORY

| | L | T | P |
|---|---|---|---|
| **Unit-I : Introduction** | 3 | 1 | 0 |

Characteristics of digital system, Types of Digital circuits, Number system: Direct conversion between bases Negative numbers & BCD and their arithmetic's, Boolean Algebra, Minimization of Boolean Functions :Map & Tabular method upto 6 variable and miltiple output circuits Error detecting & correcting codes, Hamming & cyclic codes.

6

**Unit-II : Combinational Logic Circuits**

Design Procedure, Adders, subtractors & code conversion, Multiplexers/ Demultiplexers, encoder / decoders, decimal adders & amplitude comparators, ROM as decoder, PLA & PAL.

6

**Unit-III : Sequential Logic Circuits**

Flip –Flops and their conversions, Analysis and synthesis of synchronous sequential circuit, excitation table, state table & state diagram. Design of synchronous counters, shift registers and theie applications.

**Algorithm State Machine:** ASM chart, Timing considerations, Control Implementation Design with Multiplexers, PLA control

**Asynchronous Sequential Circuits:** Analysis Procedure Reduction of state & flow table, Race free state assignment.

10

**Unit-IV : Logic Families**

Diode, BJT & MOS as a switching element concept of transfer characteristics, Input characteristics and output characteristics of logic gates, Fan-in, Fan-out, Noise margin, circuit concept and comparison of various logic families: TTL, IIL, ECL, NMOS, CMOS Tri-state logic, open collector output, Interfacing between logic families, packing density, power consumption & gate delay.

8

**Unit-V : Hazard and Fault Detection**

**Static and dynamic Hazard :** Gate delay, Generation of spikes, Determination of hazard in combinational circuits, Fault detection methods: Fault Table & Path sensitizing methods. 5

**Unit-VI : Memories**

Sequential, Random Access, NMOS & CMOS Static and Dynamic Memory elements, one and multi-dimensional selection arrangement, Read-only memories, Formation of memory banks.

5

**Text Books :**

1. Digital Design by M Moris Mano, 2nd Edn.PHI
2. Introduction to Digital Microelectronic Circuits, by Gopalan, TMH

**Reference Books :**

1. Switching Circuit & Logic Design by Hill & Peterson, Wiley
2. Digital Circuit & Logic Design, by Holsworth.

**TEC-303**

**ELECTRONICS MEASUREMENTS AND INSTRUMENTATION**

| L | T | P |
|---|---|---|
| 3 | 1 | 0 |

**Unit-I : Theory of Measurement**

Introduction, Performance Characteristics: static & dynamic standards, Error analysis: Sources, types and statistical analysis

3

**Unit-II : Transducers**

**Passive transducers :** Resistive, Inductive and capacitive

**Active transducers :** Thermoelectric, piezoelectric & photoelectric :

**Bridges :** Direct current and alternating current bridges, LCR bridges

7

**Unit-III : Analog Meters**

AC analog meters: Average, Peak and RMS responding voltmeters, sampling voltmeters.

Electronics Analog meters: Electronics analog DC and AC voltmeter and ammeters, Electronic analog ohmmeter and multimeter

6

**Unit-IV :Digital Meters**

Analog to digital converter: Transfer characteristics, A/D Conversion techniques: Simple potentiometric & servo method, successive approximation, ramp type, Integrating & dual-slope intergrating method.

D/A Converter : Transfer characteristics, D/A conversion techniques Digital mode of operation, performance characteristics of D/A converters.

Display devices : Decimal, BCD and straight binary number, indicating system, numeric & alpha number display using LCD & LED, specification of digital meters: display digit & counts resolution, sensitivity , accuracy, speed & settling time etc.

10

**Unit-V : Oscilloscopes & RF Measurements**

Types of oscilloscopes, controls, Measurements voltage, frequency time & Phase. High frequency measurements – RF impedancy

**Probes:** Types of probes, probe loading & measurement effect, probe specifications

6

**Unit-VI: Signal Generators & Analyzers**

Signal Generators: Sine-wave, non- sinusoidal & function generators, frequency synthesis techniques & digital signal generators.

**Signal Analyzers :** Distortion, wave and Network spectrum analyzers

6

**Text Books :**


1. Slectronic Instruments & Instrumentation Technology by MMS Anand, PHI Pvt. Ltd., New Delhi Ed. 2005
2. Electronics Instrumentation by H.S. Kalsi TMH Ed. 2004

**Reference Books :**


1. Electronics Instrumentation & Measurement Techniques by W.D. cooper & A.D. Helfrick, PHI 3rd Ed.
2. Electronic Measurement & Instrumentation by Oliver & Cage Mc-Graw Hill.


**TEE 353**

## NETWORK LAB

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**Note : Minimum eight experiments are to be performed from the following list.**

1. Verification of principle of superposition with dc and ac sources
2. Verification of Thevenin, Norton and Maximum power transfer theorems in ac circuits
3. Verification of Tellegin's theorem for two networks of the same topology
4. Determination of transient response of current in RL and RC circuits with step voltage input
5. Determination of transient response of current in RLC circuit with step voltage input for underdamp, critically damp and overdamp cases
6. Determination of frequency response of current in RLC circuit with sinusoidal ac input
7. Determination of z and h parameters (dc only) for a network and computation of Y and ABCD parameters
8. Determination of driving point and transfer functions of a two port ladder network and verify with theoretical values
9. Determination of image impedance and characteristic impedance of T and ∏ networks, using O.C. and S.C. tests
   Write Demo for the following (in Ms-Power point)
10. Verification of parameter properties in inter-connected two port networks : series, parallel and cascade also study loading effect in cascade
11. Determination of frequency response of a Twin – T notch filter
12. College may add any three experiments in the above list.

**TEC-351**

## ELECTRONICS LAB 1ST

| L | T | P |
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1. Study of CRO and multimeter applications.
2. Plot V-I characteristics of Junction diode under forward and reverse-biased condition. (Si & Ga)

3. Draw the waveshape of the electrical signal at the input and output points of the half-wave, full wave and bridge rectifiers.
4. Plot the V-I characteristics of zener diode.
5. Plot the I/P output characteristics for the common-base transistor.
6. To plot output characteristics of FET & measure pinch-off voltage. Calculate FET parameters at a given operating point.
7. Realize a voltage regulator using zener diode and study the load characteristics.
8. Design of P.S : 220/230 V (AC), 5VDC, 200 mA.

* College may add two more experiments in the above list

**TEC-352**

## DIGITAL ELECTRONICS LAB

| L | T | P |
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1. Bread-board implementation of various flip-flops.
2. Bread-board implementation of counters & shift registers.
3. Determination of Delay time and NAND, NOR, Ex-OR, AND & OR Gates.
4. Transfer characteristics of TTL inverters & TTL Schmitt Trigger inverter.
5. Transfer characteristics of CMOS inverters series and CD40 series and estimation of Gate delay of CD40 series CMOS inverter.
6. Monoshot multivibrators using 74121 and 74123.
7. Clock circuit realization using 555 and CMOS inverter and quartz crystal.
8. Adder/ subtractor operation using IC7483 4 bit/ 8 bit.
9. Demultiplexer / Decoder operation using IC-74138.
10. Modulo N counter using programmable counter 74190.

**TEC-353**

### INSTRUMENTATION & MEASUREMENT LAB

| L | T | P |
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1. Study of semiconductor diode voltmeter and its us as DC average responding AC voltmeter .
2. Study of L.C.R. bridge and determination of the value of the given components.
3. Study of distortion factor meter and determination of the % distortion of the given oscillator.

4. Study of the transistor tester and determination of the parameters of the given transistors.
5. Study of the following transducer
   (i) PT-100 trans
   (ii) J- type trans.
   (iii) K-type trans
   (iv) Presser trans
6. Measurement of phase difference and frequency using CRO (lissajous figure)
7. Measurement of low resistance Kelvin's double bridge.
8. Radio Receiver Measurements
9. RF Low and High Power Measurements

* College may add two more experiments in the above list.

**TCS 407**

**DATA STRUCTURES USING C**

**L T P**

**3 1 0**

**Unit - I**

**Introduction:** Basic Terminology, Elementary Data Organization, Structure operations, Algorithm Complexity and Time-Space trade-off

**Arrays**: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices and Vectors.

**Stacks:** Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack.

**Recursion:** Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion, Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

**UNIT - II**

**Queues:** Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, D-queues and Priority Queues**.**

**Linked list**: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

**UNIT – III**

**Trees**: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked

Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm**.**

**Searching and Hashing**: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

**UNIT – IV**

**Sorting**: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting**.**

**Binary Search Trees**: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

**UNIT - V**

**Graphs:** Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

**File Structures**: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

**Reference text books:**


1. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., New Delhi.
2. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002
3. A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.


**Supplementary reference books:**


1. K Loudon, "Mastering Algorithms With C", Shroff Publisher & Distributors Pvt. Ltd.
2. Bruno R Preiss, "Data Structures and Algorithms with Object Oriented Design Pattern in C++", Jhon Wiley & Sons, Inc.
3. Adam Drozdek, "Data Structures and Algorithms in C++", Thomson Asia Pvt. Ltd.(Singapore)


**TEC-401**

**ELECTROMAGNETIC FIELD THEORY**

| **L** | **T** | **P** |
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**Unit-I**

Review of Vector analysis, Rectangular, Cylindrical and Spherical coordinates and their transformation. Divergence, gradient and cvrv in different coordinate systems. Electric field intensity, Electric Flux density, Energy and potential.

**Unit-II**

Current and conductors, Diclectrics and capacitance, Poission's and Laplace's equation.

**Unit-III**

Steady magnetic field, magnetic forces, materials and inductance, Time varying field and Maxwell's equation.

**Unit-IV**

Uniform plane waves, Plane wave reflection and dispersion.

**Unit-5**

Transmission lines, and guided waves

**Text Book**

Mayt, W.H. and Buck, J.A. 'Engineering Electromagnetics Tata McGraw Hill Publishing Co. Ltd., New Delhi Seventh edition.

Reference Books


1. Jordan E.C. and Balmain K.G. 'Electromagnetic' wave and radiating systems. PHI Second edition.
2. Krans, F 'Electromagnetics ' Tata McGraw Hill Fifth edition.
3. Ramo S, Whinnery T.R. and Vanduzer T, 'Field and Waves in Communication electronics' John Wiely and Sons Third edition.


**TEC-402**

**SIGNAL S AND SYSTEMS**

| **L** | **T** | **P** |
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| **3** | **1** | **0** |

**Unit-I : Signals and Systems**

**6**

Continuous-time and discrete-time Signals, Transformations of the Independent Variable, Exponential and Sinusoidal Signals, Continuous-Time and Discrete-Time LTI Systems and their properties, convolution sum and convolution integrals, LTI System described by differential and difference equation.

**Unit-II : Fourier Series and Fourier Transformer**

**10**

The response of LTI Systems to Complex Exponentials, Fourier Series Representation of Continuous-time Periodic Signals and their Properties, Continuous time and discrete time Fourier Transforms and their properties, System Characterized by Linear Constant Coefficient Differential equations and Difference equation.

**Unit-III : Time and Frequency Characterization of Signals and Systems**

**6**

Magnitude Phase Representation of the Fourier Transform, Magnitude Phase Representation of the Frequency response of LTI systems, Time domain Properties of Ideal Frequency Selective filter, Time Domain and Frequency Domain aspects of Non ideal filters, First Order and Second Order Continuous Time and Discrete time Systems.

**Unit-IV : Sampling and Laplace Transform**

**6**

Signal representation by samples, sampling theorem, Impulse train sampling, sampling of discrete time signals, discrete time processing of continuous time signals.

Laplace Transform, Region of convergence, inverse Laplace Transform, Analysis and characterization of LTI System, Block diagram representation, Unilateral Laplace transform.

**Unit-V : Z-Transform**

**8**

Z-Transform, Region of convergence, Inverse Z-transform, analysis and characterization of LTI system, Block diagram representation, Unilateral Z-transform.

**Text Book**

1. V. Oppenheim, A.S. Willsky and S. Hamid Nawab, 'signals & System', PEARSON Education, Second Edition, 2003.

**Reference Book**

1. Roberts, "Signals and Systems" TATA McGraw Hills.
2. P. Ramesh Babu, R. Ananda Natarajan, ."Signals and Systems", SCITECH Publications.
3. Charles L. Phillips, John M.PARR and EVEA. RISKIN, "Signals, Systems and Transforms", PEARSON Education, Third Edition.
4. Chen 'Signals & Systems, Oxford University, Press.

**TEC-403**

**SEMICONDUCTOR MATERIALS AND DEVICES**

| L | T | P |
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**Unit-I : Crystal Properties and charge Carriers in Semiconductors**

**7**

1. Elemental and compound semiconductor materials, crystal lattice structure.
2. Bonding forces and energy bands in solids, charge carriers in semiconductors, carrier concentrations, drift of carriers in electric and magnetic fields.

**Unit-II : Excess Cariers in Semiconductors**

**7**

3. Optical absorption, luminescence, carrier life time and photo conductivity, diffusion of carriers.

**Unit-III : Junction Properties**

**8**

5. Equilibrium conditions, biased junctions, steady state conditions, break down mechanism (rectifying diodes, Zener diodes).
6. Transient conditions, metal semiconductor junctions, hetero junctions, (Varactor Diode, switching diodes and Schottky diodes.)

**Unit-IV : Transitors and Optoelectronic Devices**

**9**

7. Bipolar junction transistors: Fundamentals of BJT operation, amplification with BJTs, metal semiconductor field effect transistors (MESFET), metal insulator semiconductor field effect transistors (MISFET), Construction, Operation and characteristics of above devices.
8. Photodiodes, photo detectors, solar cell, light emitting diodes, light emitting materials, optical fibre, semiconductor lasers, material for semiconductor lasers.

**Unit-V : Negative Conductance Microwave Devices and Power Devices**

**8**

9. Tunnel diodes, degenerate semiconductors, transit time device: the IMPATT diode, the transferred electron mechanism : The GUNN diode.
10. Four layer devices : P-N-P-N diode, semiconductor controlled rectifier (SCR), bilateral devices : DIAC, TRIAC, IGBT.

**Text Book**

1. Ben G. Streetman, "Solid state electronic devices", Perason Eduction, 2003, Fifth edition .

**Reference Books :**

1. J. Millman and Halkiyas, "Integrated Electronics", TMH, 2002.
2. S.M. Sze, "Physics of Semiconductor devices", John Wiley.
3. Adir Bar-Lev, "Semiconductor and electronic devices", PHI.
4. D.A. Neaman, "Semiconductor physic and devices – basic principles", Home wood IL, 1992.

**TEE-406**

## ENERGY CONVERSION

| | L | T | P |
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| | 3 | 1 | 0 |

**UNIT-I** **8**

**Basic Concepts in Rotating Machines :** Elementary Machines, Synchronous Machines. d.c. Machine. Generated voltage of a.c. winding, distributed winding, hormonic content in distributed winding.

**Rotating Magnetic field :** Physical picture, Torque in round rotor machine.

Operations of Basic Machine Type : Synchronous machines, a.c. machines, d.c. machine, Matching characteristics of electric machines and load.

**UNIT- 2** **8**

**D.C. Motor:** Introduction, e.m.f. and torque e.m.f equations, torque equation, power balance, liner magnetization circuit model, Generating mode, motoring mode, armature reaction, compensating winding, commutation, method of excitation, **Characteristics of D.C. motor :** Shunt, Series compound.

Starting of D.C. motor, speed control of d.c. motor, breaking of d.c. motors.

**Unit-3** **8**

**Synchronous Motor :**

Introduction, Basic machine model, circuit model, determination of armature reaction, operating characteristics of motoring machine, operation at constant load with variable excitations.

**Induction Motor :**

Introduction, Constructions, flux and e.m.f. wave in induction motor, slip and frequency on rotor current, rotor e.m.f. and torque production, equivalent circuit, torque slip characteristics, break down torque, starting torque, starting of induction motor, speed control.

**Unit-4** **8**

**Motor Control by Static Power Converter**

Motivation – Characterizes of power devices : Diode, SCR, TRIAC, GTO, Power transistor, Power MOS, IGBT, SIT, SITH, MCT.

Power converter : a.c./d.c. converter, a.c./ac. Converter, d.c./d.c. converter, d.c./a.c. Converter, control, D.c. motor control through converters, single phase converter, discontinuous armature current, full converter, torque speed characteristics, dual converter, control of d.c. series motor, these phase converter.

**UNIT-5** **8**

**Chopper control of d.c. motor:**

Principle of operation, slip-up chopper, voltage and current wave forms, commutation A.C. motor control: Slip power recovery schemes, state kramer drive, phase control of induction motor.

**Inverters:**

Single phase half-bridge inverter, single-phase bridge inverter, three phase inverter, voltage and hormonic control of inverter, PWM inverter, sinusoidal pulse inverter.

**Text Books:**

I.J. Nagrath, D.P. Kothari: Electric Machines, TMH 2nd Ed.

**Reference Books:**

1. Fitzgarald, Kingsley, Kusko, Dumas : Electrical Machines, TMH.
2. M.H. Rashid : Power Electronic Circuits. Devices and applications, PHI.

**TCS 457**

**DATA STRUCTURES LAB**

| **L** | **T** | **P** |
|---|---|---|
| **0** | **0** | **2** |

**Write Program in C or C++ for following.**

- Array implementation of Stack, Queue, Circular Queue, List.
- Implementation of Stack, Queue, Circular Queue, List using Dynamic memory Allocation.
- Implementation of Tree Structures, Binary Tree, Tree Traversal, Binary Search Tree, Insertion and Deletion in BST.
- Implementation of Searching and Sorting Algorithms.
- Graph Implementation, BFS, DFS, Min. cost spanning tree, shortest path algorithm.

**TEC-451**

**ELECTRONICS LAB-II**

| L | T | P |
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1. Study of single stage RC-coupled BJT amplifier (frequency response. Max. signal handling capacity, input impedance)
2. Study of single RC coupled FET amplifier (frequency response, max. signal handling capacity input impedance)

3. Study of Class AB/B push-pull amplifier.
4. Study of tuned amplifier and construction of oscillators.
5. Realization of fixed frequency Wein-bridge oscillator.
6. To realize emitter follower amplifier using Darlington pairs transistor and find the input impedance.
7. Application of operational amplifiers as summer, difference and integrator.
8. Op-Amp used as instrumentation amplifier.

* College may add two more experiments in the above list.

**TEC- 452**

**ELECTRONIC WORKSHOP & PCB LAB**

| L | T | P |
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(I) Winding Shop: Step down transformer winding of less than 5VA.
3

(II) Soldering shop: Fabrication of DC unregulated power supply
1

(III) PCB Lab: (a) Artwork & printing of a simple PCB.
2

(b) Etching & drilling of PCB.
2

(IV) Wiring & fitting shop: Fitting of power supply along with a meter in cabinet.
2

(V) Testing of power supply fabricated.
1

**Note:** No design work is involved.

**TEE- 456**

**ENERGY CONVERSION LAB**

| L | T | P |
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Minimum 8 experiments are to be performed from the following:

1. To obtain speed torque characteristics of a dc shunt motor.
2. To obtain speed torque characteristics of a dc series motor.
3. To run a dc shunt motor clockwise as well as anticlockwise.
4. To control the speed of a dc motor by field control.

5. To control the speed of a dc motor by armature voltage control
6. To obtain the running speed/torque characteristics of an induction motor.
7. To obtain the v-curves of a synchronous motor.
8. To obtain characteristic of SCR.
9. To study a UJT triggering of an SCR
10. To study commutation of an SCR by any commutation circuit.
11. Speed control of a single phases motor using TRIAC.
12. Organizing a chopper circuit using a power transistor.
13. Speed control of dc motor sing a phase controlled converter.
14. Speed control of dc motor using chopper.
15. Speed control of an induction motor using an inverter.

# U.P. TECHNICAL UNIVERSITY

# LUCKNOW

# Revised Syllabus

# 2nd Year (3rd & 4th Semester)

## [Effective from the session 2005-06]

**B. Tech.**

**Electronics & Communication Engineering (Common to Electronics and Electronics & Telecommunication Engg.) and B. Tech. Instrumentation & Control (Common to Applied Electronics & Instrumentation, Electronics & Instrumentation, Electronics Instrumentation and Control and Instrumentation Engg.)**