

ANNA UNIVERSITY : COIMBATORE – 13
First Year B.E. / B.Tech. 2007 – 2008 batch

Information Technology							
Sl. No.	II Semester	Hours / week			Marks		
		L	T	P	Sessional	Exam.	Total
	THEORY						
1	Communication Skills *	3	0	0	50	50	100
2	Engineering Mathematics – II *	3	1	0	50	50	100
3	Material Science *	3	0	0	50	50	100
4	Environmental Science *	3	0	0	50	50	100
5	Basics of Electrical Engineering \$	3	1	0	50	50	100
6	Basics of Electronics Engineering \$	4	0	0	50	50	100
	PRACTICALS						
1	Engineering Graphics Laboratory *	1	0	3	50	50	100
2	Electrical Engineering Laboratory \$	0	0	3	50	50	100
3	Electronics Engineering Laboratory \$	0	0	3	50	50	100

*	Common to all Branches of Engineering and Technology
\$	Common to CSE and IT

Note : Syllabus for Communication Skills will be published shortly

(Common to all branches of Engineering and Technology)

UNIT - I MULTIPLE INTEGRALS (12)

Double integration in Cartesian and Polar coordinates – Change of order of integration – Area between two curves – Area as double integrals – Triple integration in Cartesian coordinates – Volume as Triple integrals (Simple problems only)

UNIT - II VECTOR CALCULUS (12)

Gradient, divergence and curl – Line, surface and volume integrals – Green's, Gauss divergence and Stoke's theorems (without proof) – Verification of the above theorems and evaluation of integrals using them.

UNIT - III ANALYTIC FUNCTIONS (12)

Function of a complex variable – Analytic function – Necessary conditions – Cauchy – Riemann equations – Sufficient conditions (excluding proof) – Properties of analytic function – Harmonic conjugate – Construction of Analytic functions - Conformal mapping: $w = z + a$, az , $\frac{1}{z}$ and bilinear transformation.

UNIT - IV COMPLEX INTEGRATION (12)

Cauchy's theorem (without proof) – Cauchy's integral formula – Taylor and Laurent series (without proof) – Singularities – Classification – Cauchy's residue theorem – Contour integration – circular and semi-circular contours (excluding poles on real axis).

UNIT - V LAPLACE TRANSFORM (12)

Laplace Transform – Conditions for existence – Transform of elementary functions – Basic properties – Derivatives and integrals of transforms – Transforms of derivatives and integrals – Initial and final value theorems – Transform of unit step function – Transform of periodic functions. Inverse Laplace transform – Convolution theorem – Solution of linear ODE of second order with constant coefficients and first order simultaneous equations with constant coefficients using Laplace transformation.

Lecture 45 Tutorial 15 Total 60**Reference Books**

- 1 Veerarajan. T., "Engineering Mathematics (for first year), Fourth Edition Tata McGraw- Hill Publishing Company Limited, New Delhi, 2005.
- 2 Kandasamy. P, Thilagavathy. K and Gunavathy. K, "Engineering Mathematics" – S.Chand and Co. New Delhi 2007.
- 3 Venkataraman.M.K, "Engineering Mathematics, Volume I & II Revised Enlarged Fourth Edition", The National Pub. Co., Chennai, 2004.
- 4 Widder. D.V., "Advanced Calculus", Second Edition, Prentice Hall of India, New Delhi, 2000.

(Common to all branches of Engineering and Technology)

UNIT - I SEMICONDUCTING MATERIALS AND DEVICES (9)

Elemental and compound semiconductors. Intrinsic and extrinsic semiconductors - Properties. Carrier concentration in intrinsic and extrinsic semiconductors (qualitative). Material preparation - Czochralski's technique and zone refining technique. Hall effect - Hall coefficient in extrinsic semiconductors, experimental determination of Hall coefficient. Application of Hall effect. Semiconductor devices – Solar Cells, LED, Photodiode, LDR, LCD and Strain Gauges.

UNIT - II MAGNETIC MATERIALS (9)

Ferro and ferrimagnetic materials – Properties. Heisenberg and domain theory of ferromagnetism. Hysteresis. Hard and soft magnetic materials. Ferrites – structure, preparation and applications. Devices and applications - Permanent magnets, transformer cores, magneto optical recording, magnetic valves and bearings, Superconducting Magnets, SQUIDS.

UNIT - III SMART MATERIALS (9)

Shape Memory alloys (SMA) – Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA. Nanophase materials – preparation – mechanical alloying and solgel technique, properties & applications. Superconductivity BCS theory of superconductivity (qualitative), Types of superconductors, properties - High T_c superconductors. Application of superconductors – SQUID, Cryotron, Magnetic levitation. Metallic glasses – Preparation, properties & applications.

UNIT - IV NANOMATERIALS AND CHARACTERIZATION (9)

Fabrication methods – Top down processes – Milling, lithographics, machining process – Bottom-up process – Vapour phase deposition methods, plasma-assisted deposition process, MBE and MOVPE, liquid phase methods, colloidal and solgel methods – Methods for templating the growth of nanomaterials – Ordering of nanosystems, self-assembly and self-organisation – Preparation, safety and storage issues.

UNIT - V NANODEVICES AND THEIR VARIOUS APPLICATIONS (9)

Nanomagnetic materials – Particulate nanomagnets and geometrical nanomagnets – Magneto resistance – Probing nanomagnetic materials – Nanomagnetism in technology – Carbon nanotubes – fabrication- applications – Organic FET, organic LED's – Organic photovoltaics – Injection lasers, quantum cascade lasers, optical memories, electronic applications, coulomb blockade devices.

Reference Books**Total 45**

- 1 Jayakumar S, "Materials Science", R K Publishers, Coimbatore, 2004.
- 2 Raghavan V, "Materials Science and Engineering - A first course", Prentice Hall of India, New Delhi, 2001
- 3 James F Shackelford, S "Introduction to Materials Science for Engineers", 6th edition, Macmillan Publishing Company, New York. 2004.
- 4 William D Callister Jr, "Materials Science and Engineering – An Introduction", John Wiley and Sons Inc., 6th edition, New York, 2003.

(Common to all branches of Engineering and Technology)

UNIT - I (9)

Atmosphere – Planet Earth – Biosphere – Hydrosphere – Lithosphere – Ecosystem and Bio diversity – endemic and endangered species – habitat – wet lands – deforestation – hotspot – composition of atmosphere – Troposphere – stratosphere – mesosphere – thermosphere – ozone and ozone depletion – Air pollution – pollution sources , effects and control – green house effect and global warming – climate change – Case Studies in current scenario.

UNIT - II (9)

Water – hydrologic cycle – ground water – water shed – water use and quality – point and non-point sources of pollution – oceans and fisheries – salinity – temperature – density – pressure – light – bioluminescence – tsunamis – glaciers – water pollution – dissolved oxygen – surface water treatment – waste water treatment – acid rain – thermal pollution, noise pollution and control - Case Studies in current scenario.

UNIT - III (9)

Land – weathering and erosion - types of weathering – types of soil – soil erosion – land slides – deserts – types – desertification – land degradation – features of desert – geochemical cycling – solid and hazardous waste, chemical waste, radio active waste – non hazardous waste - Case Studies in current scenario.

UNIT – IV (9)

Future policy and alternatives – fossil fuels – nuclear energy – solar energy – wind energy – hydroelectric energy – geothermal energy – tidal energy – sustainability – green power – nano technology – international policy - - Case Studies in current scenario.

UNIT - V (9)

Biogeographical classification of India – Biodiversity in India – India as mega diversity nation – hotspots of biodiversity in India – threats to biodiversity – conservation of biodiversity – environment protection act – issues and possible solution – population growth - population explosion – environment and human health - Case Studies in current scenario.

Reference Books**Total 45**

- 1 Linda D. Williams – “Environmental Science Demystified”, Tata McGraHill Publishing Company Limited , 2005
- 2 G. Tyler Miller, JR _ “Environmental Science “, Thomson, 2004
- 3 William P. Cunningham – “Principles of Environmental Science”, Tata McGraHill, New Delhi, 2007
- 4 Bharucha Erach –“The Biodiversity of INDIA”, Mapin Publishing Private Limited, Ahamedabad, India.
- 5 Trivedi R.K., “Hand Book of Environmental Laws, Rules, Guidelines, Compliances and Standards”, Volume I & II, Enviromedia

(Common to CSE and IT)

UNIT - I FUNDAMENTALS OF DC AND AC CIRCUITS (12)

Fundamentals of DC circuits: Ohm's law, Kirchhoff's law, Simple resistive circuits – Effect of series and parallel resistances – Mesh and Nodal analysis – Simple problems.

Fundamentals of AC circuits: RMS and Average values of sine wave, Form factor, Peak factor. Single phase AC circuits – Impedance, Power and Power Factor – RL, RC, RLC circuits - Simple AC circuits – problems

UNIT - II FUNDAMENTALS OF MAGNETIC CIRCUITS (12)

Ohm's law of magnetic circuit, Simple and composite magnetic circuits, Effect of air gap – leakage factor – fringing effect – Simple problems. Faraday's law of electromagnetic induction – Self and Mutually induced EMF – Statically and Dynamically induced EMF – Simple problems.

UNIT - III DC MACHINES AND TRANSFORMERS (12)

DC Machine: Construction – EMF equation of DC generator – Types of Generators and Motors – Characteristics.

Transformer: Construction – EMF equation – Transformation ratio – Types of Transformers – Instrumentation Transformer.

UNIT - IV INDUCTION MACHINES (12)

Three phase Induction Motor: Construction, Types – Principle of Operation – Torque Equation – Slip Vs Torque Characteristics of Cage and wound rotor.

Single Phase Induction Motor: Principle of Operation – Types – Applications.

UNIT - V POWER SUPPLIES (12)

Half Wave and Full Wave Rectifiers – Bridge Rectifier – Types of filters – Voltage Regulator – Introduction to SMPS and UPS

Lecture 45 Tutorial 15 Total 60

Reference Books

- 1 B.L.Theraj and A.K.Theraja, "Electrical Technology", S.Chand & Company LTD, New Delhi, 2005
- 2 V.N.Mittel, "Basic Electrical Engineering", Tata Mc Graw Hill, New Delhi, 1990.
- 3 V. Del Toro, "Electrical Engineering Fundamentals", Prentice Hall of India, New Delhi, 1993.

(Common to CSE and IT)

UNIT - I INTRODUCTION TO SEMICONDUCTORS AND DIODES (12)

Introduction : Semiconductors – N-Type and P-Type – Majority and Minority Carriers – PN Junction Characteristics – Type and Applications – Power Supplies – Rectifier – Filters – Voltage Multiplier – Zener Regulators.

UNIT - II TRANSISTORS-INTRODUCTION TO SMALL SIGNAL AMPLIFIER (12)

Amplification – Transistor Characteristic Curve – Transistor – Types – Transistor as Switch – Measuring gain – Common Emitter Amplifier – Stabilizing the Amplifier – Other Configurations.

UNIT - III LARGE SIGNAL AMPLIFICATION – OSCILLATORS (12)

Basic features – Amplifier classification – Class A,B, AB, C and Switched Mode Amplifiers – Oscillators – RC, LC, Crystal and Relaxation Oscillators – SCR.

UNIT - IV DIGITAL LOGIC AND COMBINATIONAL CIRCUITS (12)

Binary number System and Codes – Basic Logic Gates and Truth Tables – Boolean Algebra and De-Morgan;s Theorem – Logic Circuits – Sum of Product Methods – Product of Sum Method – Simple Design of Combinational Logic Networks – Digital Arithmetic – Addition, Subtraction, Multiplication and Division of Binary Numbers.

UNIT - V SEQUENTIAL LOGIC CIRCUITS (12)

Flip Flops – SR Flip Flop, Clocked SR, Master Slave, SR, JK Flip Flop – D Flip Flop – Registers – Types of Registers – Counters – Synchronous and Asynchronous Counters – BCD Decade Counter.

Reference Books**Total 60**

- 1 Charles A Schuler,"Electronics Principles and Applications", 6th edition, Mc. Graw Hill, 2003.
- 2 Albert Malvino, David J Bates,"Electronic Principles", 7th Edition, TMH, 2007
- 3 Santiram Kal, "Basic Electronics", PHI, 2002.

1	ENGINEERING GRAPHICS LABORATORY	L	T	P	M
		1	0	3	100

(Common to all branches of Engineering and Technology)

- Note**
- Use of drawing board and mini drafter is not at all required.
 - Student's skill in the graphical communication of concepts and ideas in the design of engineering products are to be obtained by training them to understand objects by making free hand sketches of simple engineering objects and computer 2D and 3D modeling techniques.

CONCEPTS AND CONVENTIONS (4)

Importance of graphics in engineering communication of concepts and ideas in the design of engineering products – conventional and computer methods – layout, orthographic and isometric representation techniques - relative merits and demerits – 2D and 3d modeling - specifications of size and layout of drawing sheets – Lettering and dimensioning – conventions followed.

CURVES AND SHAPES USED IN ENGINEERING PRODUCTS (4)

Primitive and Prismatic shapes - Conics – ellipse, parabola and hyperbola – equations used and parametric interpretations – ellipsoid, paraboloid and hyperboloid – involutes and cycloids – applications - tangents and normals – mathematical requirements - their importance and applications to engineering products.

FREE HAND SKETCHING PRACTICES (7)

Representation of Three Dimensional objects – Need for and importance of multiple views and their orientations – Concept of orthographic projection - Developing skills through free hand sketching of multiple views from pictorial views of objects – isometric (pictorial) representation of objects from multiple views – simple exercises to practice.

DEVELOPMENT OF SURFACES – PRACTICES (5)

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones - freehand sketching practices - simple exercises to practice.

2D DRAFTING (20)

Importance of 2D drafting – sketching, mirroring, scaling, copying (simple and multiple) dimensioning - wiring diagram and piping layout drawings - Practice of Computer Aided Drafting and dimensioning using appropriate software packages.

SOLID MODELING (20)

3D modeling techniques - constructive solid geometry (CSG) and boundary representation (BRep) techniques - solid modeling of simple and moderately complex engineering products – table, chair, V-block, flange coupling (one) half, bolts and nuts, computer monitor, slotted angle rack and such other products - Practice of solid modeling and extraction of 2D views using appropriate software packages.

Reference Books Lecture 15 Practical 45 Total 60

- 1 Dhananjay.A. Jolhe, "Engineering Drawing", Tata McGraw Hill Publishing Co., 2007
- 2 K.V.Natarajan "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2006.
- 3 M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education, 2005.
- 4 Luzadder and Duff, "Fundamentals of Engineering Drawing" Prentice Hall of India Pvt Ltd, XI Edition - 2001.
- 5 K.Venugopal, "Engineering Graphics", New Age International (P) Limited, 2002.

POINTS FOR EXAMINERS TO SET QUESTION PAPERS:

The students are expected to learn making free hand sketches (not to scale) of simple components; given isometric view, drawing plan, elevation and end view; given plan, elevation and end view, drawing isometric view on A4 size sheets. Drawing development views of simple lateral surfaces.

Simple exercises in creating simple 2D views such as plan elevation and end views of simple components and 3D models on the computer terminal using standard drafting and modeling software packages such as AutoCAD, PRO_E, Unigraphics, Solid Edge, etc.

ENGINEERING GRAPHICS – MODEL QUESTION PAPER

(Common to all branches)

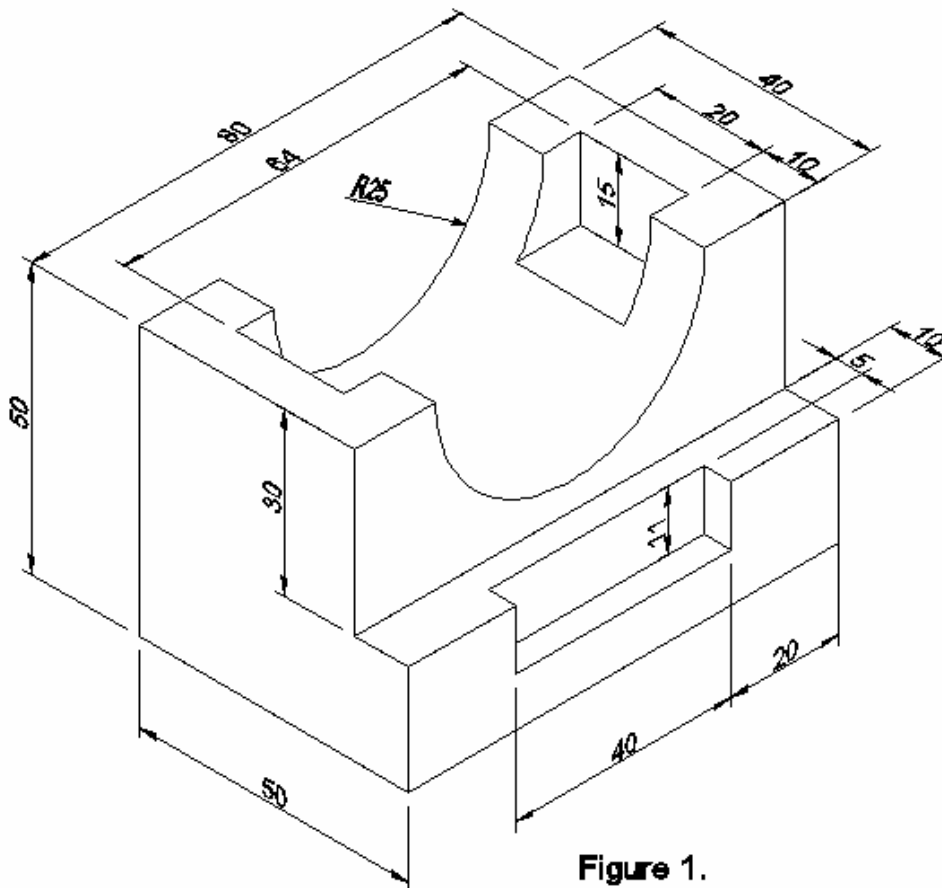
Time : 3Hours

Maximum : 100 Marks

PART A (4 X 10 = 40 Marks)

(All drawings are to be made as free hand sketches (not to scale) on A4 size drawing sheet – No need for use of mini drafter.)

1. Draw the free hand orthographic view (Plan, Elevation and Side view) for the given figure 1.



2. Draw the free hand isometric view of the object from the given orthographic views in figure 2.

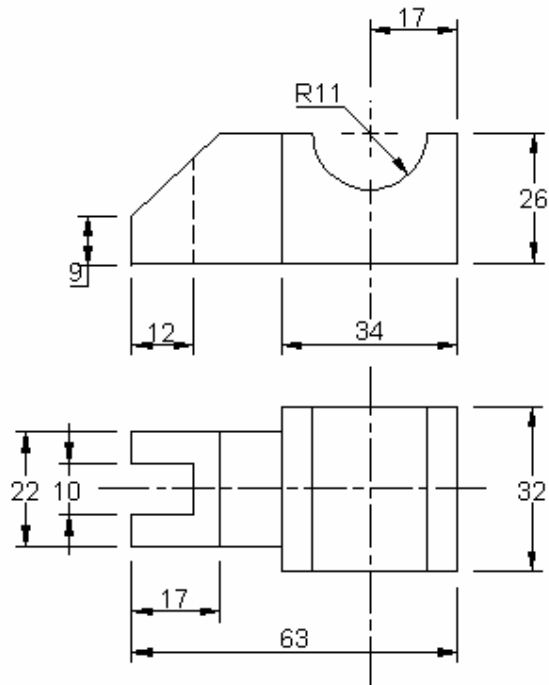


Figure 2.

3. a. Write the equation for an Ellipse. Sketch free hand an ellipse whose
 - b. major axis is greater than minor axis.
 - c. major axis is less than minor axis.
 - d. major axis and minor axis are equal.

4. Draw the development of frustum of square pyramid, of height 100mm with base 70mm and top 20mm square.

PART B (60 Marks)

5. Using any one 2D modeling software draw the two views of an object as shown in figure 3. (25)

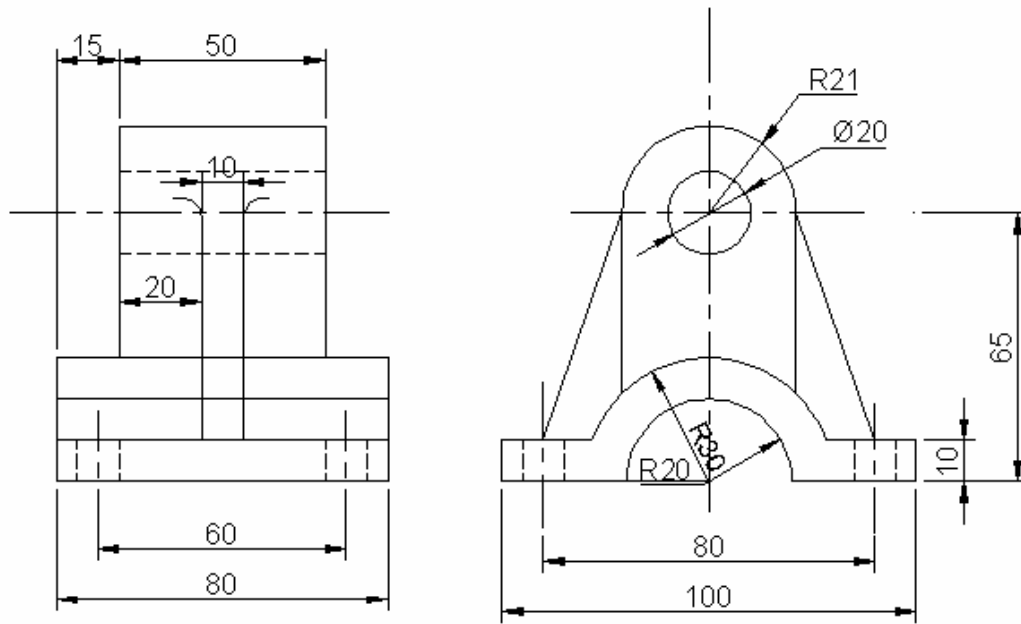


Figure 3.

6. Using any modeling software develop the 3D model of the object whose 2D views are shown in figure 4. (35)

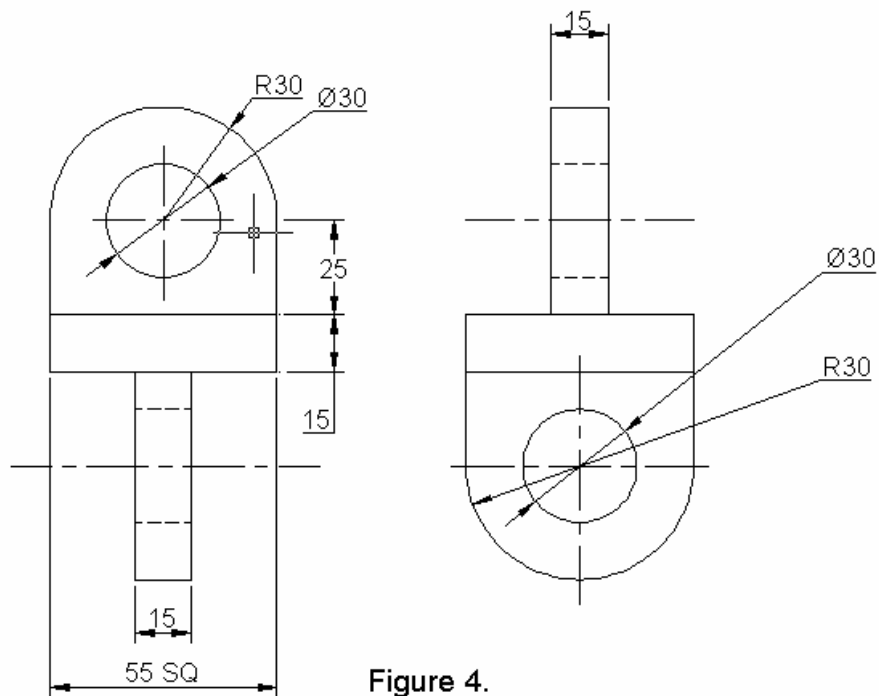


Figure 4.

LIST OF EXPERIMENTS

- 1 Verification of Ohm's law and Kirchhoff's laws
- 2 Measurement of Power and Impedance in RL, RC and RLC circuits
- 3 Open Circuit and Load Characteristics of Separately Excited DC Generator
- 4 Load Test on DC Shunt motor
- 5 Load Test on Single Phase Transformer
- 6 Load Test on Single Phase and Three Phase Induction Motor
- 7 Single Phase Half Wave and Full Wave Rectifiers
- 8 Study of Passive Filters
- 9 Study of Voltage Regulator Circuits
- 10 Study of SMPS and UPS

Total 45

LIST OF EXPERIMENTS

- 1 Forward and Reverse characteristics of PN diode and Zener Diode
- 2 Implementation of HW & FW Rectifier with simple Capacitor Filter.
- 3 Input and Output characteristics of BJT in CE configuration
- 4 Frequency response of Common Emitter Amplifier
- 5 Observation of output waveform with cross over distortion using class B complementary symmetry power amplifier.
- 6 Implementation of RC / LC Oscillator and study the waveforms.
- 7 Characteristics of UJT and SCR
- 8 Relaxation Oscillator using UJT
- 9 Verification of truth table for various TTL Logic Gates.
- 10 Half adder, Full adder, Half subtractor and Full subtractor.
- 11 Implementation and Verification of truth table RS, D and T flip Flops using Logic Gates.
- 12 Implementation and Verification of BCD Decade Counter.

Total 45