

<b>University of Mumbai</b>			
<b>CLASS: F.E (All Branches of Engineering)</b>		<b>Semester - I</b>	
<b>SUBJECT: Basic Electrical and Electronics Engineering</b>			
Periods per week (Each of 60 min.)	Lecture	5	
	Practical	2	
	Tutorial	-	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	Practical and oral examination	2	25
	Oral Examination	--	--
		Term Work	25
		Total	150

### Details of the Syllabus:-

Module	Contents	Hrs
<b>Pre-requisite</b>	a) Concepts of e.m.f., potential difference & current, battery. b) Capacitors, with uniform & composite medium, energy stored in a capacitor, R-C time constant. c) Magnetic field, magnetic circuit, Faraday's laws of electromagnetic induction, Hysteresis & Eddy current losses, energy stored in an inductor, time constant in R-L circuit.	
<b>01</b>	<b>DC circuits:</b> (only independent sources). Ohm's law, resistance, resistivity, series & parallel connections, star delta transformation, power dissipation in resistance, effect of temperature on resistance, Kirchhoff's laws, Mesh & Nodal analysis, Source transformation, Superposition, Thevenin's, Norton's and Maximum power transfer theorems.	<b>12 hours</b>
<b>02</b>	<b>A.C. circuits:</b> Generation of alternating voltage & currents, R.M.S. & Average value, form factor, crest factor, A.C. through resistance, inductance & capacitance, R-L, R-C, and R-L-C series & parallel circuits, phasor diagrams, power & power factor, series & parallel resonance. <b>Problems by analytical as well graphical methods.</b>	<b>16 hours</b>



**Practical and oral Examination:**

Practical and oral Examination will be based on one experiment performed from the list of experiment given in the syllabus and the oral will be based on the same experiment.

**Term Work**

Term work shall consist of minimum six experiments, assignments consisting numericals based on above syllabus and a written test.

The distribution of marks for term work shall be as follows,

1. Laboratory work ( Experiments and Journal )	10 marks
2. Test (at least one)	10 marks
3. Attendance (Theory and Practical	05 marks

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25 marks

The final certification and acceptance of TW ensures the satisfactory performance of laboratory work and minimum passing in the TW.

**List of laboratory experiments:**

1. Mesh and Nodal analysis.
2. Verification of Superposition theorem.
3. Maximum power Transfer theorem ( Thevenin and Norton)
4. Diode characteristics.
5. R.L.C. series & Parallel circuit.
6. Relationships between phase & line currents and voltages in a Three phase system ( Star & delta).
7. Power and phase measurement in three phase system by two wattmeter method.
8. Load test on a single phase transformer by direct loading.
9. O.C. & S.C. tests on single phase transformer.
10. Half wave & full wave rectifier ( with & without filter)
11. Input and output characteristics of CE-BJT configuration.
12. Study of electrical machines.

**Books Recommended:**

1. Vincent Deltoro: Electrical Engineering Fundamentals, Pearson Education.
2. M.S. Naidu, S. Kamakshai: Introduction to Electrical Engineering, Tata Mcgraw Hill ( Revised edition).
3. MITTLE & MITTAL, Basic Electrical Engg. 2/e ( New). Tata Mcgraw Hill.
4. Edward Hughes : Electrical Technology, Pearson Education, ( Seventh edition)
5. Joseph.A. Edminster: Electrical Circuits, Schaums outline series, Tata Mcgraw Hill
6. H.Cotton : Advanced Electrical Technology, Wheeler Publication.
7. I.J. Nagrath & D.P. Kothari: Electrical machines, Tata Mcgraw Hill ( Second edition).
8. Dr. P.S.Bimbhra : Electric Machinery, Khanna publishers.(revised edition)
9. William Hayt, Kemmerly, Durbin : Engineering Circuit Analysis, Tata Mcgraw Hill ( Sixth edition).
10. Boylestad, Nashelsky: Electronic Devices & circuit Theory, Pearson Education.
11. Bhargava, Kulshreshta, Gupta: Basic Electronics & Linear Circuits,TTTI, Chandigarh, Tata Mcgraw Hill.
12. S.K. Bhattacharya, S. Chatterjee: Industrial Electronics & control, TTTI, Chandigarh, Tata Mcgraw Hill .