

Basic Electrical and Electronics Engineering (BEE)

F.E. Sem. I

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral Exam	2	25
Oral Exam	–	–
Term Work	–	25

SYLLABUS

Pre-requisite

- A. Concepts of e.m.f, potential difference and current, battery.
- B. Capacitors, with uniform and composite medium, energy stored in a capacitor, R–C time constant.
- C. Magnetic field, magnetic circuit, Faraday's laws of electromagnetic induction, Hysteresis and Eddy current losses, energy stored in an inductor, time constant in R–L circuit.

1. DC circuits : (Only independent sources).

Ohm's law, resistance, resistivity, series and parallel connections, star delta transformation, power dissipation in resistance, effect of temperature on resistance, Kirchhoff's laws, Mesh and Nodal analysis, Source transformation, Superposition, Thevenin's, Norton's and Maximum power transfer theorems.

2. A.C. circuits :

Generation of alternating voltage and currents, R.M.S. and Average value, form factor, crest factor, A.C. through resistance, inductance and capacitance, R–L, R–C and R–L–C series and parallel circuits, phasor diagrams, power and power factor, series and parallel resonance.

Problems by analytical as well graphical methods.

3. Three phase circuits :

Three phase voltage and current generation, star and delta connections (balanced load), relationship between phase and line currents and voltages. Phasor diagrams, measurements of power by two wattmeter method.

Problems by analytical as well graphical methods.

4. Single phase transformer :

Construction, working principle, e.m.f. equation, ideal and practical transformer, phasor diagrams, equivalent circuit, O.C. and S.C test, efficiency and regulation. All day efficiency.

5. Electrical Machines : (No numerical is expected)

- **DC Generators and Motors** : Construction, working principle, e.m.f. equation, classification and applications.
- **Three phase Induction Motor** : Construction, working principle, squirrel cage rotor and phase wound rotor, production of rotating magnetic field, slip.
- **Single phase Induction Motor** : Construction, working principle, double field revolving theory, split phase, capacitor start and shaded pole motor.

6. (A) Semiconductor Devices : (No numerical is expected)

P–N junction diode, Zener diode, their construction, working and characteristics. BJT its construction, characteristics and applications. (only CE configuration)

(B) Rectifiers : (No numerical is expected)

Analysis of half wave and full wave rectifier with resistive load and its parameters ripple factor, rectification efficiency, regulation. Rectifier circuit with capacitive filter only.

Reference :

1. Electrical Engineering Fundamentals – (*Vincent Deltoro*), Pearson Education.
2. Introduction to Electrical Engineering – (*M.S.Naidu, S. Kamakshaiyah*), Tata Mcgraw Hill (Revised Edition)
3. Basic Electrical Engg. 2/e – (*Mittle & Mittal*), Tata McGraw Hill
4. Electrical Technology – (*Edward Hughes*), Pearson Education, (Seventh edition).
5. Electrical Circuits, Schaums outline series – (*Joseph A.*), Tata McGraw Hill.
6. Advanced Electrical Technology – (*H. Cotton*), Wheeler Publication.
7. Electrical Machines – (*I. J. Nagrath & D.P. Kothari*), Tata Mcgraw Hill (Second Edition)
8. Electric Machinery – (*Dr. P.S.Bimbhra*), Khanna Publishers (Revised Edition).
9. Engineering Circuit Analysis – (*William Hayt, Kemmerly, Durbin*), Tata Mcgraw Hill (Sixth Edition)
10. Electronic Devices & Circuit Theory – (*Boylestad, Nashelsky*), Pearson Education.
11. Basic Electronics & Linear Circuits, TTTI, Chandigarh – (*Bhargave, Kulshreshtha, Gupta*), Tata Mcgraw Hill.
12. Industrial Electronics & Control, TTTI, Chandigrah – (*S.K. Bhattacharya, S. Chatterjee*), Tata Mcgraw Hill.

