

ANURAG Engineering College
(An Autonomous Institution)

I B.Tech I Semester Supplementary Examinations, June/July – 2024

BASIC ELECTRICAL ENGINEERING
(COMMON TO CSE & AIML)

Time: 3 Hours

Max. Marks: 60

Section – A (Short Answer type questions)

(10 X 1M = 10M)

Answer All Questions

	Course Outcome	B.T Level	Marks
1. State KCL.	CO1	L2	1M
2. State KVL.	CO1	L2	1M
3. Define form factor of alternating current.	CO2	L2	1M
4. Define Real power.	CO2	L2	1M
5. Define Efficiency of transformer.	CO3	L2	1M
6. Which type of losses are obtained by O.C test on transformer.	CO3	L1	1M
7. State Flemming's Left Hand rule.	CO4	L2	1M
8. What is rotating magnetic field ?	CO4	L1	1M
9. What are the types of Batteries?	CO5	L1	1M
10. What is the necessity of power factor improvement?	CO5	L1	1M

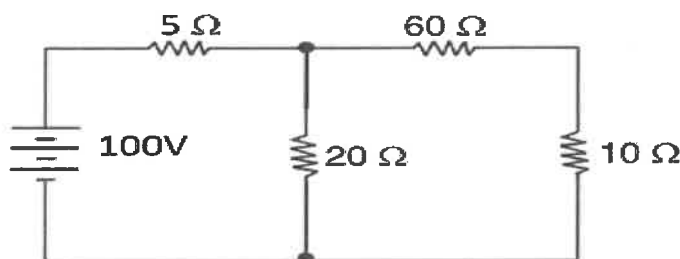
Section B (Essay Questions)

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) i) State and explain Norton's Theorem.
ii) Find the current flowing through the $10\ \Omega$ resistor using Norton's theorem,

CO1	L3	5M
		5M



OR

- B) Explain about time domain analysis of first order RC series circuit.
12. A) i) Explain the analysis of series RL circuit excited by sinusoidal input and derive the expression for impedance, current and power factor.
ii) A coil having a resistance of $7\ \Omega$ and an inductance of $31.8\ \text{mH}$ is connected to $230\ \text{V}$, $50\ \text{Hz}$ supply. Calculate a) impedance b) circuit current c) phase angle d) power factor and e) power consumed.

CO1	L3	10M
CO2	L3	5M
		5M

OR

- B) i) Explain about resonance in series RLC circuits.
ii) A resistance of $10\ \text{ohms}$, inductance of $0.5\ \text{H}$, capacitance of $10\ \mu\text{F}$ are connected in series across $50\ \text{V}$, $50\ \text{Hz}$ supply, calculate impedance, current, p.f, power consumed.

CO2	L3	5M
		5M

13. A) i) Derive the condition for maximum efficiency of a transformer. CO3 L3 5M
 ii) A 40 kVA transformer has iron loss of 450 W and full-load copper loss of 850 W. If the power factor of the load is 0.8 lagging, Calculate the a) full-load efficiency b) the maximum efficiency. 5M
OR
- B) Explain about the open circuit test and short circuit tests on single phase transformer. CO3 L3 10M
14. A) i) With a neat sketch, explain about the constructional details of a dc machine. CO4 L3 5M
 ii) Derive the e.m.f equation of d.c. generator. 5M
OR
- B) i) Draw and explain about the torque-slip characteristics of a 3-phase induction motor. CO4 L3 5M
 ii) Explain about the working operation of a synchronous generator. 5M
15. A) i) What are the components of LT switchgear ? CO5 L3 5M
 ii) Explain the operation of MCB in detail. 5M
OR
- B) i) Explain the importance of earthing. What are the types of earthing. CO5 L3 5M
 ii) Explain the elementary calculations for energy consumption. 5M