Question Paper Code: R15A11EE01

R15

ANURAG Engineering College

(An Autonomous Institution)

I B.Tech I Semester Supplementary Examinations, January - 2025

BASIC ELECTRICAL ENGINEERING

(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions

		Course Outcome	B.T Level	Marks
1.	What is Self & Mutual Inductance? How is it determined?	CO1	L1	2M
2.	State Superposition Theorem with example.	CO1	L1	3M
3.	Express the terms Average value, R.M.S value and form factor.	CO2	L1	2M
4.	The impedance of an electrical circuit is (30 -j50) ohms. Determine (i) the resistance, (ii) the capacitance, and (iii) the magnitude of the impedance, when the circuit is connected to a 240 V, 50 Hz supply.	CO2	L2	3M
5.	List the causes of losses in DC Generator.	CO3	L1	2M
6.	What are the different types of DC motors? Mention its applications.	CO3	L2	3M
7.	Why is the rating of a transformer given in kVA?	CO4	L2	2M
8.	Draw the circuit diagram of a single-phase transformer.	CO4	L2	3M
9.	Write short notes on moving iron instruments with attraction type?	CO5	L1	2M
10.	Compare different damping torques required in measuring instruments?	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Using the superposition theorem, find I_s in the circuit shown in fig.1.	CO1	L2	10M

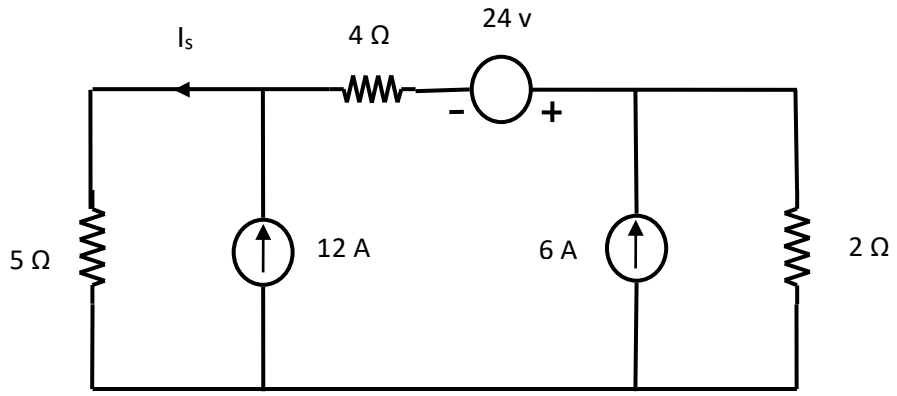

Fig. 1

OR

B)	State and explain Faraday's laws of Electromagnetic induction?	CO1	L2	10M
12. A)	A coil has a resistance of 4 Ω and an inductance of 9.55 mH. Calculate (i) the reactance, (ii) the impedance, and (iii) the current taken from a 240V, 50 Hz supply. Determine also the phase angle between the supply voltage and current.	CO2	L3	10M

OR

B)	Derive the relationship between phase and line voltages in a balanced three phase delta connected system.	CO2	L3	10M

13. A)	Explain the basic principle of working of DC machine and derive the EMF equation for DC generator.	CO3	L3	10M
	OR			
B)	With a neat sketch, explain the construction, working of DC Motor with its parts.	CO3	L3	10M
14. A)	What is meant by Transformer? Draw the circuit diagram for Single Phase Transformer and also explain the Principle, Construction, Working of it.	CO4	L2	10M
	OR			
B)	Open circuit and short circuit test on a 5 KVA, 220/440 V, 50 Hz single phase transformer gave the following results: O.C test: 220V, 2A, 100W (L.V) side S.C test: 40V, 11.4A, 200W (H.V) side Determine the efficiency and approximate regulation of the transformer at full load 0.9 power factor lagging.	CO4	L3	10M
15. A)	With essential diagram and labels, Describe the necessary portions of the Permanent Magnet Moving Coil (PMMC) instrument. Discuss its function.	CO5	L2	10M
	OR			
B)	With a neat sketch, explain the principle of operation of the repulsion type moving iron instrument.	CO5	L2	10M