R22

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech I Semester Supplementary Examinations, June/July–2024
ELECTRICAL MACHINES – I
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours   **Max. Marks: 60**

Section – A (Short Answer type questions) (10 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	What is the function of a commutator in DC Generator?	CO1	L1	1M
2.	What is critical speed?	CO1	L1	1M
3.	Write the formula for Back EMF.	CO2	L1	1M
4.	Write the losses in DC Machine.	CO2	L1	1M
5.	Brake test is conducted on which DC Machine?	CO3	L2	1M
6.	What you will find out by doing Hopkinson's test?	CO3	L1	1M
7.	What is the principle of Transformer?	CO4	L1	1M
8.	How to minimize hysteresis loss?	CO4	L2	1M
9.	What are the necessary conditions required for parallel operation of single phase transformer?	CO5	L1	1M
10.	What are the advantages of auto transformer over two winding transformer?	CO5	L1	1M

Section B (Essay Questions)
Answer all questions, each question carries equal marks. (5 X 10M = 50M)

			Course Outcome	B.T Level	Marks
11.	A)	Illustrate the constructional features of DC generator in detail with neat circuit diagram.	CO1	L3	10M
		OR			
	B)	i) Explain about demagnetizing AT/pole and cross magnetizing AT/pole	CO1	L2	7M
		ii) Briefly explain the function of compensating winding in DC machine	CO1	L2	3M
12.	A)	With the help of neat sketch, explain the working of 3 point starter.	CO2	L3	10M
		OR			
	B)	i) A 250V shunt motor runs at 1000 rpm at no load and takes 8A. The total armature and shunt field resistances are 0.2 and 250 ohms respectively. Calculate the speed when loaded and taking 50A. Assume the flux to be constant.	CO2	L3	6M
		ii) Explain any one method of speed control of DC motor.	CO2	L2	4M
13.	A)	With a neat sketch, explain the procedure of Swinburne's test? Mention its advantages and disadvantages.	CO3	L3	10M
		OR			
	B)	Explain the procedure of conducting brake test on DC machine with a neat circuit diagram.	CO3	L2	10M
14.	A)	Draw and explain the phasor diagram of single phase transformer on load considering with winding resistance.	CO4	L3	10M
		OR			

B) A 40 KVA single phase transformer has got maximum efficiency of 97 % at 80 % of full load at UPF. During the day, the load on the transformer is as follows.

No. of hours	Load	Power factor
9	6 KW	0.6 lag
8	25 KW	0.8 lag
7	30 KW	0.9 lag

Determine the All day efficiency of the transformer.

CO4   L3   10M

15. A) The OC and SC test data of 4 kVA, 200/400V, single phase transformer when supplying full load at 0.8 lagging p.f is given below.
OC test: 200V, 0.8A, 70W (HV open circuit)
SC test: 20V, 10A, 60W (LV short circuit)
Calculate efficiency at a) full load, b) ½ Full load and c) Voltage regulation at Full load.

CO5   L3   10M

OR

B) Explain the working of single-phase auto transformer with neat diagrams. Derive an expression for saving of copper in it when compared to ordinary two winding transformer.

CO5   L3   10M