Regulation: R18 *Subject code: 2P3BD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A')

B.Tech III Semester Supplementary Examinations, March/April 2023

ELECTRICAL MACHINES I

(EEE)

Maximum Marks: 70 Date:04.04.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Define flux and flux density.
2 Write the linear and non-linear magnetic circuits.
3 Write the working principle of dc-generator?
4 Differentiate lap and wave windings.
5 State the significance of Back emf.
6 What would happen if the DC Motor is directly switched on to the supply without any starter.
7 Write the working principle of transformer?
8 What is the condition for maximum regulation of a transformer.
9 Why transformer rating is expressed in KVA?
10 What are the effects of third harmonic component in a three-phase transformer.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Define energy storage element and explain about the types of energy storage elements. 10M

OR

12 State the electromagnetic phenomena useful for the electromagnetic energy conversion in rotating electric machines. 10M

13 Explain with relevant diagrams, the different methods of excitation of DC machines. 10M

OR

14 What are the losses that occur in dc machines? Derive the condition for maximum efficiency in a dc generator. 10M

15 Derive an equation for armature torque in dc motor. 10M

OR

16	DC motor connected to a 460V supply has an armature resistance of 0.25 ohm. Calculate the value of back e.m.f when the armature current is 120A and the value of armature current when the back e.m.f is 447.4V?	10M
17	Derive the EMF equation of transformer? Hence derive the voltage ratio.	10M
	OR	
18	The primary and secondary windings of a 40 kVA, 6600/250 V single phase transformer have resistances of 10 Ω and 0.02 Ω respectively. The total leakage reactance is 35 Ω as referred to the primary winding. Find full load regulation at a p.f. of 0.8 lagging.	10M
19	Enplane the parallel operation of single phase and three phase transformers.	10M
	OR	
20	Explain with the help of connection and phasor diagrams how a Scott connection is used to obtain two-phase supply from three-phase supply.	10M