R20 Regulation *Subject code: 3P3BD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, June 2026

ELECTRICAL MACHINES I

(EEE)

Maximum Marks: 70 Date: 18.06.2026 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)		Marks	CO	BTL
1	Define flux and flux density.	2M	1	L1
2	Define commutation.	2M	1	L1
3	Write the working principle of dc-generator.	2M	2	L1
4	State Fleming right hand rule and Fleming left hand rule.	2M	2	L1
5	State the significance of Back emf.	2M	3	L1
6	Draw the speed-torque characteristics of dc series motor.	2M	3	L1
7	What is mean by regenerative test?	2M	4	L1
8	Define transformer.	2M	4	L1
9	Write the losses in transformer.	2M	5	L1
10	Why transformer rating is expressed in KVA?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Discusses the self-inductance and mutual inductance of the coil.	10M	1	L2
	OR			
12	Explain about the armature reaction.	10M	1	L2
13	Explain the construction of a dc machine with a neat sketch.	10M	2	L2
	OR			
14	Explain about the Cross magnetizing and de- magnetizing.	10M	2	L2
15	Derive an equation for armature torque in dc motor.	10M	3	L2
	OR			
16	Draw the schematic diagram of a 3-point starter and explain its working with protecting devices.	10M	3	L2
17	Derive the EMF equation of transformer and also derive the voltage ratio.	10M	4	L2
	OR			
18	A single-phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60cm^2.if the primary winding be connected to a 50 Hz supply at 520V. Calculate: i) The peak value of flux density in the core ii) The voltage induced in the secondary winding.	10M	4	L2
19	Discuss the parallel operation of single phase and three phase transformers.	10M	5	L2
	OR			
20	Explain the effect of nonlinear characteristics of B-H curves of a magnetic material.	10M	5	L2