R20 Regulation *Subject code: 3E5BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

ELECTRICAL MACHINE DESIGN

(EEE)

Maximum Marks: 70 Date: 20.04.2026 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 self inductance.	2M	1	L1
2	What is meant by heating?	2M	1	L1
3	What is the cause of noise in transformer?	2M	2	L1
4	What are the properties of transformer oil?	2M	2	L1
5	Define real flux density.	2M	3	L1
6	Write the expression for rotor current.	2M	3	L1
7	Distinguish between cylindrical pole and salient pole construction.	2M	4	L1
8	What is critical speed of alternator?	2M	4	L1
9	Define optimization methods.	2M	5	L1
10	Write the applications of CAD.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Explain in detailed galvanometer coil, relay contact coil.	10M	1	L2
	OR			
12	Write the force as a partial derivative of stored energy with respective to position of moving element.	10M	1	L2
13	Explain the different cooling methods of a transformer.	10M	2	L2
	OR			
14	Derive the condition for getting maximum efficiency in a transformer.	10M	2	L2
15	Give the detailed procedure for design of rotor bars and end rings of a squirrel cage induction motor.	10M	3	L2
	OR			
16	Explain briefly on design of slip ring rotor.	10M	3	L2
17	Explain the procedure for design of field winding in synchronous machines.	10M	4	L2
	OR			
18	With neat sketch indicate the location of damper windings in a synchronous machine and mention its uses.	10M	4	L2

19	Design the optimization methods of CAD.	10M	5	L2
	OR			
20	Explain briefly on FEM based machine design.	10M	5	L2