R18 Regulation *Subject code: 2P3BD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2024

ELECTRICAL MACHINES-I
(Electrical and Electronics Engineering)

Maximum Marks: 70 Date:09.12.2024 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 which carries 10M.
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)		CO	Bloom Tx
1	Write the energy balance equation?	1	L1
2	What are the applications of galvanometer?	1	L1
3	Define Critical field resistance.	2	L1
4	What is the purpose of providing compensating winding in DC Machine?	2	L1
5	Write down the equation for torque developed in dc motor?	3	L1
6	List the different losses in a dc machine.	3	L1
7	Define self and mutual induced emf.	4	L1
8	Define voltage regulation of transformer	4	L1
9	What is an Auto- Transformer?	5	L1
10	State the conditions that should be satisfied to get sinusoidal emf's in 3-φ transformers.	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Draw and explain the flux-linkages Vs current characteristics of linear magnetic Circuit. [10M]	1	L3
	OR		
12	Derive an expression for Lifting power of magnet. [10M]	1	L3
13	Explain the principle of operation of DC generator. [10M]	2	L3
	OR		
14	Derive an EMF equation of a DC generator [10M]	2	L3
15	The armature of a 4-pole DC motor has a lap connected winding accommodated in 60 slots, each containing 20 conductors. If the useful flux per pole is 25mwb.Calculate the torque developed when the armature current is 60A. [10M]	3	L3
	OR		
16	Explain 4-point starter with neat sketch. [10M]	3	L3

17	Derive an EMF equation of single-phase transformer. [10M]	4	L3
	OR		
18	Explain the operation of single-phase transformer under load with vector diagram and equivalent circuit. [10M]	4	L3
19	Compare an Auto- Transformer with a two-winding Transformer. [10M]	5	L4
	OR		
20	Explain about auto-transformer with a neat sketch and give its applications. [10M]	5	L3