Regulation: R20

Subject code: **3P3BD**

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular Examinations, July-2022

ELECTRICAL MACHINES-I

Maximum Marks: 70

Date: 27.07.2022 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	State Lenz's law.	2 M
2	What is the purpose of providing compensating winding in DC Machine?	2 M
3	Write down the equation for torque developed in dc motor?	2 M
4	List the different losses in a dc machine.	2 M
5	Give Brief account on field test on DC machine	2 M
6	What is Back EMF? Explain its significance	2 M
7	Define an ideal transformer.	2 M
8	Distinguish between off-load and on-load tap-changing.	2 M
9	Write the EMF equation of a transformer? Define Transformation ratio?	2 M
10	Write down the types of connections in 3-φ transformer?	2 M

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11	Explain the working principle of operation of DC generator.	10M
	OR	
12	Derive an EMF equation of a DC generator	10M
13	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
	OR	
14	Draw the following characteristics in case of DC series motor a) Speed(N) Vs Armature current (I_a) b) Torque (T) Vs Armature current (I_a) c) Speed (N) Vs Torque(T)	10M
15	Explain the different testing of the DC machines?	10M
	OR	
16	Conduct Retardation test on the DC machine and give relevant formulae	10M
17	Explain the constructional details and working of the single-phase transformer.	10M
	OR	

18	Draw and explain the circuit diagram for conducting short-circuit test on a single-phase transformer.	10M
19	Write down the differences between three phase bank transformer and single unit transformer.	10M
	OR	
20	Explain about auto-transformer with a neat sketch and give its applications.	10M