



R18 Regulation

Subject code: 2P3BD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, February 2024

ELECTRICAL MACHINES- I

(EEE)

Maximum Marks: 70

Date: 23.02.2024 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	BTL
1	Define Electro Magnetic Force?	CO1	L1
2	Sketch the Flux-linkage vs current characteristic of magnetic circuits?	CO1	L3
3	What is the use of laminated armature in a DC generator?	CO2	L1
4	Explain the features of DC series generator distinguish it from other types of DC generators?	CO2	L2
5	Illustrate the significance of back e.m.f in a DC motor?	CO3	L2
6	Draw the circuit diagram for conducting Swinburne's test.	CO3	L3
7	Derive the condition for Zero regulation in a single phase transformer.	CO4	L2
8	State different types of transformers.	CO4	L2
9	Write the advantages of poly phase transformers?	CO5	L1
10	Write the applications of Auto transformers?	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		M	CO	BTL
11	Explain in detail about the mechanism of energy stored in a magnetic field with necessary supporting equations.	10M	CO1	L3
	OR			
12	Derive the torque expression of a multi excited magnetic field system.	10M	CO1	L3
13	Explain the principle of operation of DC generator.	10M	CO2	L2
	OR			
14	a) Derive the expression for induced e.m.f in a dc generator. b) The external characteristic of a series generator from zero to 70V at 350A is a straight line. This generator is connected as a booster between a station bus-bar and a feeder of 0.35Ω resistance. Find the voltage between the bus-bar and far end of the feeder at a current of 200A.	5M 5M	CO2	L4 L3
15	a) Explain the Brake test in a DC machine. b) How 4-point starter is different from 3-point starter. With a neat diagram explain the construction and working of 4-point starter.	5M 5M	CO3	L2 L3
	OR			

16	Name & Explain the losses of a DC machine and Classify them into constant and variable.	10M	CO3	L4
17	Explain the constructional details of single-phase transformer.	10M	CO4	L2
	OR			
18	a) Distinguish between a core type and a shell type transformer. b) Explain the significance and procedure of a Sumpner's test and draw the necessary connection diagram for it and how it is different from OC and SC test.	5M 5M	CO4	L4 L3
19	Write down the differences between three phase bank transformer and single unit transformer.	10M	CO5	L4
	OR			
20	Explain about auto-transformer with a neat sketch and give its applications.	10M	CO5	L2