Course Code: 1930203 **Roll No:** **MLRS- R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech I Sem Supplementary Examination, February-2022

Electrical Machines – I

(EEE)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Answer any FIVE questions.
2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	List the various types of DC generators and also discuss their applications.	7M	CO1	R
	b)	Explain the process of commutation in DC machines? Discuss suitable methods to improve it?	7M	CO1	U
2		In a 120V compound generator, the resistance of the armature, shunt and series windings are 0.06Ω, 25Ω and 0.04Ω respectively. The load current is 100A at 120V. Find the induced E.M.F. and the armature current when the machine is connected as i) Long shunt and ii) short shunt. How will the ampere-turns of series field be changed in case (i) if a diverter of 0.1Ω be connected in parallel with the series field winding? Neglect brush drop.	14M	CO1	Ap
3	a)	With a neat diagram explain the construction and operation of 4 point starter used for DC motor starting.	7M	CO2	U
	b)	Write about various methods used to control the speed of a DC series motor.	7M	CO2	U
4	a)	Derive the torque equation of a DC motor.	6M	CO2	U
	b)	A DC motor drives a load, the torque of which varies as the square of the speed. The motor takes current of 15A when speed is 600rpm Calculate the speed and current when motor field winding is shunted by a diverter of the same resistance as that of field winding. Mention assumptions made if any.	8M	CO2	Ap
5	a)	Classify and list the various types of tests used for determining the efficiency of a dc motor/generator.	7M	CO3	R
	b)	Why Swinburne's test is called as most economical test? In this test how efficiency is pre determined in the case of motor and generator.	7M	CO3	U
6		With a neat circuit diagram, explain the operation of Hopkinson's test. Mention its advantages and disadvantages.	14M	CO3	U

7	a)	Explain the principle of operation of transformer and also derive the induced EMF of a transformer.	7M	CO4	U
	b)	What are the various losses that occur in the operation of a transformer? And also derive the condition for maximum efficiency of a transformer.	7M	CO4	U
8	a)	Explain with neat circuit diagrams the procedure for conduction of Open Circuit (OC) & Short Circuit (SC) Tests on a 1-Φ transformer.	8M	CO5	U
	b)	Discuss the various 3-Φ transformer connections and their applications.	6M	CO5	U

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