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

MLRS

II B.Tech I Sem Regular End Examination, February-2022
Electrical Machines – I
(EEE)

Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
    2. In Part – A, answer all questions which carries 20 marks.
    3. In Part – B, answer any one question from each unit.
       Each question carries 10 marks and may have a, b as sub questions.

PART- A
(10*2 Marks = 20 Marks)

1.	a)	Write the emf equation of DC generator.	2M	CO1	BL1
	b)	What is critical field resistance? Give its importance.	2M	CO1	BL1
	c)	What is the necessity of Starter?	2M	CO2	BL1
	d)	Sketch the speed-torque characteristics of dc series motor.	2M	CO2	BL2
	e)	Distinguish between direct and indirect tests on dc machines.	2M	CO3	BL2
	f)	Discuss about Field's test in DC series machine.	2M	CO3	BL2
	g)	Define All-Day efficiency of a single phase transformer.	2M	CO4	BL1
	h)	Draw the no-load phasor diagram of single phase transformer.	2M	CO4	BL1
	i)	Define transformer.	2M	CO5	BL1
	j)	Why the transformer rating is in kva but not in kw?	2M	CO5	BL1

PART- B
(10*5 Marks = 50 Marks)

2	a)	Explain the constructional details and principle of operation of DC generator.	5M	CO1	BL4
	b)	Briefly explain the action of commutator with neat sketches.	5M	CO1	BL

OR

3		Explain the effect of armature reaction in a DC- Generator and methods to eliminate effects of armature reaction.	10M	CO1	BL4

4	a)	Explain the speed-torque characteristics of the DC shunt motor. Derive the relevant expression for it.	5M	CO2	BL4
	b)	Explain the constructional and principle of operation of 3-point starter.	5M	CO2	BL4

OR

5		A 600 V dc motor drives a 60 kW load at 900 rpm. The shunt field resistance is 100 Ω and the armature resistance is 0.16 Ω. If the motor efficiency is 85%, determine: (a) the speed at no-load and the speed regulation. (b) the rotational losses.	10M	CO2	BL3
6	a)	What are the advantages of Hopkinson's test over Swinburne's test and what are its limits?	5M	CO3	BL1
	b)	Explain Brake test on DC shunt motor.	5M	CO3	BL4

OR

7		The Hopkinson's test was performed at full load on two similar shunt machines. The test results are: Line voltage = 110 V, Line current = 48 A, Armature current = 230 A, (motor) Field currents = 3 A and 5 A, Armature resistance = 0.035 Ω (each), Brush contact drop = 1 V per brush Calculate the efficiency of both the machines.	10M	CO3	BL3
8	a)	Derive the emf equation of a single-phase transformer.	5M	CO4	BL6
	b)	Explain, with necessary relationships, the effect of variations of frequency & supply voltage on iron losses.	5M	CO4	BL4

OR

9		A 100 kVA, 1100/230 V, 50-Hz transformer has an HV winding resistance of 0.1 Ω and a leakage reactance of 0.4 Ω. The LV winding has a resistance of 0.006 Ω and a leakage reactance of 0.01 Ω. Find the equivalent winding resistance, reactance and impedance referred to the HV and LV sides. Convert these to pu values.	10M	CO4	BL3
10	a)	Explain the necessary conditions for parallel operation of two transformers.	5M	CO5	BL4
	b)	Explain briefly about auto-transformer. Mention its advantages and disadvantages over two winding transformer.	5M	CO5	BL4

OR

11		What is the need for conducting a test on a transformer and explain OC and SC test on a single phase transformer?	10M	CO5	BL4

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