Code No: P21EET03

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
II B.TECH I SEMESTER END REGULAR EXAMINATIONS, JAN - 2023
ELECTRICAL MACHINES-I
(EEE Branch)
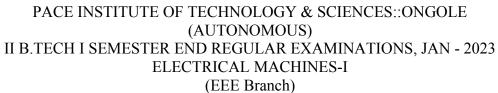
Time: 3 hours   Max. Marks: 70

Answer all the questions from each UNIT (5X14=70M)

Q.No.		Questions	Marks	CO	KL
		UNIT-I			
1.		Give the constructional features and working principle of a DC Generator. Draw the cross sectional view of a 4 pole DC Generator and label all the parts. Explain the function of each part.	[14M]	1	2
		OR			
2.	a)	Derive the EMF Equation of a DC generator	[7M]	1	2
	b)	A 250V short shunt compound generator is delivering 80A. Armature, series and shunt field resistances are 0.05Ω, 0.03Ω and 100Ω respectively. Calculate the generated emf.	[7M]	1	2
		UNIT-II			
3.	a)	Draw and Explain the electrical and mechanical characteristics of DC shunt Motors.	[7M]	2	2
	b)	Define commutation. Explain the process of commutation with neat sketches.	[7M]	2	2
		OR			
4.	a)	Explain the significance of Back-emf in a DC Motor	[7M]	2	2
	b)	How a four point starter does differs from three point starter-Explain.	[7M]	2	2
		UNIT-III			
5.	a)	Describe the speed control scheme of dc shunt motor by varying field flux with neat circuit diagram.	[6M]	3	2
	b)	Describe with the aid of a circuit diagram, the Swinburne's test for estimating the efficiency of a DC shunt machine. What are the advantages and disadvantages of this method?	[8M]	3	2
		OR			
6.	a)	Explain the construction of single phase transformer.	[7M]	3	2
	b)	Draw the phasor diagrams for transformer on-load condition for resistive and inductive loads.	[7M]	3	2
		UNIT-IV			
7.	a)	Derive the approximate equation for regulation of a transformer.	[7M]	4	2
	b)	A single phase 440/220V, 10KVA, 50 Hz transformer has a resistance and reactance of 0.2 ohm and 0.6 ohm respectively on HV side and corresponding values on LV side are 0.04 ohm and 0.14 ohm. Calculate regulation on full load for 0.8 lag pf and 0.8 lead pf.	[7M]	4	3
		OR			
8.	a)	Describe the procedure of open circuit and short circuit tests on single phase two winding transformer.	[8M]	4	2
	b)	Obtain an expression for saving for copper material in auto transformer when compared to a two winding transformer.	[6M]	4	2

		UNIT-V			
9.	a)	Explain the relationship between line and phase voltages and current in three phase transformer.	[7M]	5	2
	b)	What is the use of tertiary winding? Explain in detail.	[7M]	5	2
		OR			
10.		Explain the working of Scott connection with Phasors and neat sketch.	[14M]	5	2

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