Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject Code: 150901 **Date: 02/05/2015**

Subject Name: Electrical Machines – II

Time: 02.30pm-05.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Mention the three phase transformer connections (vector groups) in which the secondary voltage vectors are lagging the primary voltage vectors by 30^0. Draw the vector diagrams and winding diagrams for any two of these connections.	**07**
	(b)	Why we need starters for three phase induction motors? Explain rotor resistance starter with necessary circuit diagram.	**07**
Q.2	**(a)**	State and explain the conditions for satisfactory parallel operation of three phase transformers.	**07**
	(b)	A 3-phase step-down transformer is connected to 6.6 KV mains and draws 10A from the mains. Calculate the secondary line voltage and line current for the following connections. The ratio of HV to LV turns per phase is 12. Neglect losses and magnetizing current. (1) Δ/ Δ (2) Δ/Y	**07**
		OR	
	(b)	A load of 150 kVA at 0.8 lagging p.f. is shared by two transformers 'A' and 'B' connected in parallel. The per unit reactance of 'A' is 0.1 + j 0.4 and that of 'B' is 0.2 + j 0.8. Find out the kVA and kW load shared by each transformer. Neglect the losses and magnetizing currents of transformers.	**07**
Q.3		Draw the circle diagram for a 5 KW, 400 V, 3 phase, 4 pole, 50 Hz, slip-ring induction motor from the following data: No-load test readings : 400 V, 5 A, 360 W Blocked rotor test readings : 95 V, 10 A, 700 W Calculate the Full load current, Full load power factor and Full load speed of this motor using circle diagram. Also find out the maximum torque and maximum output of this motor with the circle diagram.	**14**
		OR	
Q.3	**(a)**	Briefly explain the phenomenon of Crawling and Cogging in induction motor.	**07**
	(b)	Explain with necessary figures the effect of variation of voltage and supply frequency on the performance parameters of an induction motor.	**07**
Q.4	**(a)**	Mention the types of single phase AC motors. Describe the Universal motor in detail.	**07**
	(b)	Briefly explain the construction and working of Schrage motor.	**07**
		OR	
Q.4	**(a)**	Write a short note on construction, working and application of	**07**

induction generator.

	(b)	Briefly discuss the double cage motor, its merits and demerits.	**07**
Q.5	**(a)**	Why the single phase motors are not self starting? Discuss any one technique used to start them.	**07**
	(b)	What is magnetic levitation? Write a short note on linear induction motor.	**07**

OR

Q.5	**(a)**	Briefly describe the construction and working of shaded pole single phase AC motor.	**07**
	(b)	Draw the circuit and explain the welding transformer.	**07**

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