Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER • 2014

Subject Code: 131701 Date: 30-12-2014

Subject Name: Electrical Machines

Time: 02.30 pm - 05.00 pm 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)**	Discuss open delta connections of transformers with necessary circuit and vector diagrams.	**07**
	(b)	What do mean of an ideal transformer and derive emf equation of a single phase transformer. Also define Transformation Ratio.	**07**
Q.2	**(a)**	Derive the condition for Maximum torque for induction motor and Explain Torque - Slip characteristics.	**07**
	(b)	Obtain the equivalent circuit of a 200/400 –V, 50 Hz, 1 Phase Transformer from the following test data O.C.Test : 200 V,0.7 A,70 W - on L.V. side S.C. Test : 15 V, 10 A, 85 W - on H.V. side Calculate the secondary voltage when delivering 5 KW at 0.8 p.f. lagging , the primary voltage being 200V.	**07**
		OR	
	(b)	Write and explain the conditions of parallel operation of 3-phase transformer.	**07**
Q.3	**(a)**	Explain the phenomena of armature reaction of a DC machine. State its Remedies.	**07**
	(b)	What is commutation? Give remedies for commutation.	**07**
		OR	
Q.3	**(a)**	Draw and explain the internal and external characteristics of d.c. shunt generators.	**07**
	(b)	Explain different parts of DC machine with neat and clean diagram.	**07**
Q.4	**(a)**	Explain different speed control methods for 3 phase induction motor.	**07**
	(b)	Explain the procedure to construct the circle diagram for induction motor & how various quantities are measured from circle diagram.	**07**
		OR	
Q.4	**(a)**	Explain different methods for speed control of series motors.	**07**
	(b)	Write different starters used for 3 phase induction motor and explain any one of them.	**07**
Q.5	**(a)**	Define and state the expressions for (i) Pitch factor. (ii) Distribution factor for alternator.	**07**
	(b)	What is voltage regulation? How it can be determined by using Zero power factor method in synchronous machine?	**07**
		OR	
Q.5	**(a)**	State the different methods of finding voltage regulation in alternator. Explain any one of them in detail.	**07**
	(b)	State and explain condition of synchronizing alternator with infinite bus bar.	**07**

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