Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(OLD) • EXAMINATION – WINTER 2016

Subject Code:131701 **Date:09/01/2017**

Subject Name:Electrical Machines

Time:10:30 AM to 01:00 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)**	What is an IDEAL transformer? How it differs from an actual transformer?	**07**
	(b)	Explain different losses in transformer and derive condition for maximum efficiency of transformer.	**07**
Q.2	**(a)**	Explain ward Leonard method for speed control of DC shunt motor.	**07**
	(b)	On what basis DC generators are classified? Classify DC generators.	**07**
		OR	
	(b)	Explain synchronous impedance method for finding regulation of synchronous alternator.	**07**
Q.3	**(a)**	Explain No-load and Blocked rotor test on three phase induction motor.	**07**
	(b)	Explain power stages of induction motor.	**07**
		OR	
Q.3	**(a)**	Explain different parts of DC machine.	**07**
	(b)	Explain Parallel operation of two three phase transformers.	**07**
Q.4	**(a)**	A 30KVA, 2400/120-V, 50Hz transformer has high voltage winding resistance of 0.1 ohm and a leakage reactance of 0.22 ohm. The low voltage winding resistance is 0.035 ohm and the leakage reactance is 0.012ohm. Find the equivalent winding resistance, reactance and impedance referred to the (1) high voltage side (2) low voltage side.	**07**
	(b)	Explain SCOTT connection.	**07**
		OR	
Q.4	**(a)**	For an induction motor establish relation between rotor input, rotor copper loss and rotor output.	**07**
	(b)	Explain speed torque characteristics of three phase induction motor.	**07**
Q.5	**(a)**	A short shunt compound wound DC generator delivers a load current of 28 A at 250 V. If the resistances of shunt field, series field and armature winding is 125 Ω, 0.25 Ω and 0.4 Ω respectively. Find the generated EMF. Consider 1 V/brush for brush contact drop.	**07**
	(b)	Draw and Explain different characteristics of self-excited compound generator.	**07**
		OR	
Q.5	**(a)**	Explain parallel operation of two alternators.	**07**
	(b)	Draw and explain vector diagram of loaded alternator with different power factors.	**07**

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