## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-III EXAMINATION – SUMMER 2016

Su	bject	t Code:131701 Date:31/05/201	ate:31/05/2016	
Su Tii Ins	bject me:1 tructio 1. 2.	t Name:Electrical Machines 0:30 AM to 01:00 PM Total Marks: 7 ons: . Attempt all questions. . Make suitable assumptions wherever necessary.	70	
	3.	Figures to the right indicate full marks.		
Q.1	<b>(a)</b>	Derive an equation for induce EMF of transformer. Also explain transformation	07	
	<b>(b)</b>	Explain parallel operation of two single phase transformers with necessary conditions.	07	
Q.2	(a)	List different methods for speed control of DC shunt motor. Explain any one in detail.	07	
	<b>(b</b> )	Explain armature Reaction.	07	
	<b>(b)</b>	<b>OR</b> Explain synchronous impedance method for finding regulation of synchronous alternator.	07	
Q.3	(a) (b)	Explain No-load and Blocked rotor test on three phase induction motor. Explain Equivalent circuit of three phase induction motor.	07 07	
Q.3	(a) (b)	Explain Swinburne's method for testing DC machine. Derive condition for maximum efficiency of transformer.	07 07	
Q.4	(a)	A 50KVA, 4400/220-V, 50Hz transformer has high voltage winding resistance of 3.45 ohm and a leakage reactance of 5.2 ohm. The low voltage winding resistance is 0.009 ohm and the leakage reactance is 0.015ohm. Find the equivalent winding resistance, reactance and impedance referred to the (1) high voltage side (2) low voltage side.	07	
	(D)	OR	07	
Q.4	(a) (b)	Explain power stages of induction motor. Derive an equation for torque under running condition for an induction motor.	07 07	
Q.5	(a)	A long shunt compound wound DC generator delivers a load current of 18 A at 250 V. If the resistances of shunt field, series field and armature field is 125 $\Omega$ , 0.2 $\Omega$ and 0.3 $\Omega$ respectively. Find the generated EMF. Consider 1 V/brush for brush contact drop.	07	
	<b>(b</b> )	Draw and Explain different characteristics of self excited shunt generator.	07	
Q.5	(a) (b)	Explain parallel operation of two alternators. Explain Chording factor and winding factor.	07 07	

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