Seat No.: _____

Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VI • EXAMINATION – SUMMER • 2015

Subject Code: 160901		: 160901 Date: 01/05/201	Date: 01/05/2015	
Subject Name: Electrical Machine – III Time: 10.30am-01.00pm Total Max Instructions:			70	
0.1	1. Atten 2. Make 3. Figur	npt all questions. e suitable assumptions wherever necessary. res to the right indicate full marks. Briefly discuss the brake test to find efficiency of DC machines	07	
2.1	(b)	 The no-load test of a 45 kW, 220 V DC shunt motor gave the following results. Find the efficiency of this machine for following conditions. (1) Full load as a motor (2) 80% full load as a generator No load input current = 13.5 A, Field current = 2.5 A, Armature resistance = 0.032 Ohm, Assume supply voltage equal to rated voltage. 	07	
Q.2	(a) (b)	Derive the equation of induced emf for a synchronous generator. Define and explain pitch factor as well as distribution factor. OR	07 07	
	(b)	Describe the advantages and limitations of Swinburn's test.	07	
Q.3	(a)	Explain with reason why starting torque of a synchronous motor is zero? Describe any two methods of starting of a synchronous motor.	07	
	(b)	The Hopkinson's test on two identical DC shunt machines gave the following data. Calculate the efficiency of each machine. Line voltage = 110 V, Line current = 48 A, Motor armature current = 230 A, Field currents are 3 A and 3.5 A. Armature resistance of each machine is 0.035 Ohm.	U7	
0.2		OR	07	
Q.3	(a) (b)	 Explain the construction and working of auto synchronous motor. The results of Field's test on a set of identical DC series motors are as follows: Motor armature current = 56 A, Voltage across motor = 590 V, Voltage across generator field winding = 40 V, Generator terminal voltage = 400 V, Generator current = 44 A, Armature resistance of each machine = 0.3 Ohm. Find out the efficiency of each machine. 	07	
Q.4	(a) (b)	Briefly describe the short circuit ratio and its significance. Describe the experimental setup to obtain the v-curves of a synchronous motor.	07 07	
04	(9)	UK Draw and explain the capability curve of a synchronous generator	07	
2.1	(b)	Briefly explain the operation of a synchronous machine with change in excitation and constant mechanical power input. Draw the corresponding phasor diagrams.	07	
Q.5	(a)	Explain the procedure to obtain the direct axis and quadrature axis synchronous reactance of salient pole machine.	07	
	(b)	Explain the construction and working of an induction regulator. OR	07	
Q.5	(a) (b)	Write a short note on Permanent Magnet Brush Less DC motor. Write a short note on Switched Reluctance Motor.	07 07	

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