Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-II Examination-Dec-2011

Subject code: X20903 **Date: 28/12/2011**
Subject Name: Electrical Machines I & II
Time: 10.30 am -1.00 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)**	Explain the working principle of D.C. Generator & derive the equation for induce E.M.F. for Lap & Wave Windings	**07**
	(b)	Give the Classification Of D.C. Motors & give one application of each of them ,Also explain the necessity of starter	**07**
Q.2	**(a)**	Explain the internal & external characteristics of D.C. Shunt Generator & also state the conditions when it fails to excite.	**07**
	(b)	A 7460watts, 250-V,D.C.Shunt motor takes 5A,at no-load, Calculate it's efficiency at full load, if the armature & field resistance are 0.5Ω & 250 Ω respectively. Find out the output power, when the efficiency is maximum & Is it possible to obtain that output from the machine	**07**
		OR	
	(b)	List out various speed control methods for D.C. Shunt motor & Explain any one of them with circuit diagram & it's merit & demerit over other methods	**07**
Q.3	**(a)**	Explain the working principle of transformer & also explain the significance of (a)Conservator (b)Windings (c)Core (d)Breather for transformer	**07**
	(b)	Explain the On-load behaviour of transformer, Also draw the vector diagram for resistive load & inductive load	**07**
		OR	
Q.3	**(a)**	Explain the open circuit & short circuit tests on single phase transformer	**07**
	(b)	A 230/230 V, three KVA single phase transformer gave following results: O.C.Test:-230v, 2Amp,100Watts S.C.Test:-15V,13Amp,120Watts Determine the regulation at full load 0.8 p.f. lagging & also find efficiency at half load & full load at 0.8 p.f.lagging	**07**
Q.4	**(a)**	Explain the working principle & construction of Induction motor, also derive the equation for starting torque	**07**
	(b)	Draw & explain Speed-Torque characteristic of induction motor ,Also define (a)breakdown torque(b)locked rotor torque (c) Running torque	**07**
		OR	

Q.4	**(a)**	Explain the various methods to measure the slip in induction motor	**07**
	(b)	A three phase Induction motor with star connected rotor has induced E.M.F. of 120V between two slip rings at standstill, when normal voltage applied to the stator, rotor has 0.3Ωresistance per phase& at standstill leakage reactance per phase is 1.5Ω,then calculate (i)Rotor current under short circuit condition with 4% slip (ii)The slip & rotor current, when the rotor is developing maximum torque	**07**
Q.5	**(a)**	Explain the various methods for starting of synchronous motor	**07**
	(b)	Explain the synchronous Impedance method to find voltage regulation of alternator	**07**

OR

Q.5	**(a)**	Explain the Ampere Turns method to find voltage regulation of alternator	**07**
	(b)	Explain working principle & construction of synchronous motor, also explain why is it not self starting?	**07**

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