Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-III Examination-Dec.-2011

Subject code: 131901 **Date: 20/12/2011**

Subject Name: Electrical Machines & Electronics

Time: 2.30 pm -5.00 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)**	Draw circuit diagrams of different types of D.C.generators. Write current & voltage equations for each	**07**
	(b)	Explain the construction features and working principle of a single phase transformer	**07**
Q.2	**(a)**	Why Starters are used in d.c.shunt motors? Explain 3-point Starter With neat diagram	**07**
	(b)	A long shunt generator running at 1200 r.p.m. supplies 22 KW at a terminal voltage of 220 V .The resistances of armature, shunt field and the series field are 0.05,110 and 0.06 Ω respectively. The overall efficiency at above load is 88%. Find (1) Cu losses (2) Iron &friction losses (3) The torque exerted by the prime mover.	**07**
		OR	
	(b)	A 100 KW (output),3300-V,50 Hz,3phase ,star connected induction motor has a synchronous speed of 500 r.p.m .The Full load slip is 1.8% and full load power factor 0.85.Stator copper loss 2440 W, Iron loss 3500 W. Rotational loss 1200 W. Calculate (1) The rotor copper loss (2) The line current (3) The full load Efficiency	**07**
Q.3	**(a)**	Derive condition for maximum torque for induction motor and explain Torque-Slip and Torque- speed characteristics.	**07**
	(b)	What is Voltage Regulation of an alternator ?Explain Synchronous Impendence Method	**07**
		OR	
Q.3	**(a)**	Why Single phase induction motor is not self starting motor? Explain double field revolving theory for the same motor.	**07**
	(b)	Explain different methods of speed control of three phase induction motor.	**07**
Q.4	**(a)**	Comparison between A.C & D.C Transmission.	**07**
	(b)	What do you mean by Tariff? Explain different types of Tariff.	**07**
		OR	
Q.4	**(a)**	Discuss the disadvantages of a low power factor. Also explain the methods of power factor improvement.	**07**
	(b)	Write the name of equipment used in a substation with Symbols	**04**

	(c)	Find the most economical power factor ,when the tariff is Rs 100/- per KVA of maximum demand plus a flat rate per KWh. Assume additional cost of condenser of Rs 80/- per KVA. Rate of interest & depreciation is together to be taken as 10 %	**03**
Q.5	**(a)**	What is Rectification? With the help of neat circuit diagram & wave form explain the operation of a centre tapped full wave rectifier.	**07**
	(b)	Explain single stage CE amplifier with neat circuit diagram	**04**
	(c)	State Ideal characteristics of an OP-AMP	**03**

OR

Q.5	**(a)**	What is Logic-Gate ?Draw the Truth table & symbol for NAND, NOR, OR Gate. Also State & Explain De-Morgan's Theorem.	**07**
	(b)	Draw & Explain Internal architecture of 8085 microprocessor.	**07**

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