GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER–II • EXAMINATION – WINTER • 2014

Subject Code: X21901   **Date: 26-12-2014**
Subject Name: Electrical Machines and Electronics
Time: 02:30 pm - 05:00 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)**	Describe principle and working of d.c. motor and d.c.generator.	**07**
	(b)	Explain the three phase rotating magnetic field theory for induction motor.	**07**
Q.2	**(a)**	Derive an emf equation of D.C machine.	**07**
	(b)	Discuss functions and materials of yoke, armature, commutator and brush of a dc generator. Also draw external and internal characteristics of a dc (i) Series and (ii) Shunt generators.	**07**

<div align="center">OR</div>

	(b)	Derive an emf equation of single phase transformer.	**07**
Q.3	**(a)**	Explain speed-torque characteristics of d.c. shunt and series motor.	**07**
	(b)	What is the necessity of starter in D.C. motor? Explain three point starter.	**07**

<div align="center">**OR**</div>

Q.3	**(a)**	Explain parallel condition for two alternators and procedure for operation of two alternators.	**07**
	(b)	What is the merits and demerits of Induction motor? Give comparison between squirrel-cage induction motor and slip-ring motor.	**07**
Q.4	**(a)**	What are the causes of low power factor? What are the demerits of low power factor?	**07**
	(b)	Give comparison between indoor substation and outdoor substation.	**07**

<div align="center">**OR**</div>

Q.4	**(a)**	Explain the working principle of transformer. Draw the construction of shell type and core type transformer.	**07**
	(b)	Explain torque-slip characteristics of three phase induction motor.	**07**
Q.5	**(a)**	Discuss the use of OPAM as (i) inverting, (ii) non-inverting, (iii) differential iv) comparator	**07**
	(b)	Explain full wave rectifier with suitable diagram and wave-form.	**07**

<div align="center">OR</div>

Q.5	**(a)**	Explain OR, AND, NOT, NAND and NOR gate with truth table and symbol.	**07**
	(b)	Explain the pin diagram of 8085 micro-processor.	**07**

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