

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER-II • EXAMINATION – SUMMER 2013

Subject Code: X21901

Date: 06-06-2013

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) Explain the internal and external characteristics of D.C. shunt generator. **07**

(b) What is voltage regulation? Discuss voltage regulation by synchronous impedance method for Alternator. **07**

Q.2 (a) Explain voltage build up process of d.c .generator. **07**
Derive the emf equation of D.C. generator.

(b) A 30 KW, 300 V d.c. shunt generator has armature and field resistances of 0.05 ohm and 100 ohm respectively. Calculate the total power developed by the armature when it delivers full load output. **07**

OR

(b) Derive the equations for armature torque and shaft torque for d.c. Motor. **07**

Q.3 (a) Explain the 3-phase rotating magnetic field theory for induction motor. **07**

(b) State types of transformers based on its construction. Discuss the use of breather, bushings and conservators in a transformer. **07**

OR

Q.3 (a) Define the term 'slip' of induction motor. Draw and explain the torque-slip characteristics of three phase induction motor. **07**

(b) Write short note on (i) capacitor start capacitor run motor.(ii) 1-phase shaded pole (iii) universal motor. **07**

Q.4 (a) Explain different types of equipments used in **07**

substation.

- (b)** What are the causes of poor power factor. Also **07**
explain the methods of power factor improvement

OR

Q.4 (a) Explain De-Morgan rules with suitable logic circuit. **07**

Q.4 (b) State different types of tariffs. Explain any two of them. **07**

Q.5 (a) Explain the pin diagram of 8085 micro-processor. **07**

(b) Explain full wave rectifier with necessary circuit and **07**
waveforms.

OR

Q.5 (a) Discuss AND, OR ,NOR ,NOT,NAND, Ex-OR and **07**
Ex-NOR logic gates with their truth tables.

(b) Compare AC and DC transmission ., state advantages of **07**
high transmission voltage.