

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC SEM-II Examination-Dec-2011

Subject code: X21101**Date: 22/12/2011****Subject Name: Electrical Engineering****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) List the essential parts of DC Machine. Explain briefly construction and function of each part. **07**
- (b) Explain Necessity of Starter for DC Motor & Explain three point starter for DC shunt Motor **07**

- Q.2** (a) Classify different type of DC generator. Derive EMF equation of DC generator. **07**
- (b) A shunt generator delivers 195 A at terminal voltage of 250V. The armature resistance and shunt field resistance are 0.02Ω and 50Ω respectively. The iron friction losses is equal to 950 W. Find i) EMF generated ii) Cu Losses iii) Output of prime mover iv) efficiency. **07**

OR

- (b) State different methods of speed control of DC Shunt Motor. Explain Ward Leonard method. **07**
- Q.3** (a) Explain working principle of transformer & Also derive EMF equation of transformer. **07**
- (b) The open circuit & short circuit tests on 10 KVA 450/120V 50Hz transformer gives following results: **07**
- OC test: $V_{oc} = 120V$, $I_{oc} = 4.2 A$, $W_{oc} = 80W$
(supply was on LV side)
- SC test: $V_{sc} = 9.65 V$, $I_{sc} = 22.2 A$, $W_{sc} = 120W$
(supply was on HV side)
- Compute: i) The approximate equivalent circuit constants.
ii) Efficiency & regulation under full load
Condition at 0.8 pf lag.

OR

- Q.3** (a) Explain Transformer ON Load. Draw its vector diagram at unity power factor and at lagging power factor.. **07**
- (b) A 40 KVA 3300/240 V, 50 Hz, 1-phase transformer has 660 turns on the primary. Determine i) the number turns of secondary ii) The approximate values of primary and secondary full load currents. iii) The maximum value of flux density in core. (Internal drops in winding are ignored) **07**

- Q.4 (a)** State the type of three phase induction motor. Explain how rotor rotates when three phase induction motor is connected across three phase supply & Define Slip. **07**
- (b)** List different type of starters for three phase induction motor. **07**
Explain any one in detail.

OR

- Q.4 (a)** State the various types of single phase AC motors. Explain Capacitor start and induction run type 1 phase induction motor. **07**
- (b)** Explain construction and working Principle of shaded pole motor. **07**

- Q.5 (a)** Explain construction and working and application of Universal motor. **07**
- (b)** Define Voltage regulation of alternator. State various methods to find voltage regulation and Explain any one method in detail. **07**

OR

- Q.5 (a)** Why synchronous motor is not self starting? Explain its principle of operation and methods of starting. **07**
- (b)** Explain construction and working principle of Schrage Motor. **07**
