Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE – SEMESTER V • EXAMINATION – WINTER - 2012

## Subject code: 150901

## Date: 11-01-2013

Subject Name: Electrical Machine-II

Time: 02:30 pm to 05:00 pm

## **Instructions:**

# **Total Marks: 70**

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) Explain the different phase group of power transformer using vector and **07** winding diagram.
  - (b) State the condition for parallel operation of transformer. Explain the Sumpner's **07** test with necessary circuit diagram.
- Q.2(a) A 3-phase step-down transformer is connected to 6.6 KV mains and takes 10 A. **07** calculate the secondary line voltage, line current for the following connections. The ratio of turns per phase is 12 Neglect losses. (1)  $\Delta/\Delta$  (2) Y/Y (3)  $\Delta/Y$ 
  - (b) Explain the principle and operation of Induction generator. 07

#### OR

- (b) Explain the on load and off load tap-changers of transformer.
- Q.3 (a) Explain the equivalent circuit of an Induction motor with necessary circuit 07 diagram.
  - (b) A 3-phase 6-pole,50 Hz , 400 V star connected induction motor has following 07 test results.

No-Load Test:- 400 V, 9 A, 1250 watts.

Short-circuit Test:- 200 V, 50 A, 6930 watts.

Determine the power scale using circle diagram.

### OR

- Q.3 (a) Explain the automatic Y/  $\Delta$  starter for 3-phase induction motor using power and 07 control circuit.
  - (b) State and explain any two method of speed control of Induction motor. 07
- Q.4(a) Explain principle, advantage and application of linear induction motor. 07
  - (b) Explain the performance of induction motor against variation in supply voltage **07** and frequency.

### OR

- Q.4 (a) Explain cogging and crawling of induction motor.
  (b) Explain the principle and operation of 1-phase capacitor start and run motor.
  07
- Q.5 (a) Explain why a single phase induction motor does not self start. Discuss its **07** operation based on double revolving field theory.
  - (b) Explain the construction and working principle of Shaded pole induction motor. 07

#### OR

- Q.5 (a) Explain the action of commutator as a frequency converter. 07
  - (b) Explain the construction and working principle of Repulsion motor. 07

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