

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-IV(OLD) • EXAMINATION – WINTER 2016**

**Subject Code:142401**

**Date:19/11/2016**

**Subject Name:Electro Mechanical Energy Conversion.- 1**

**Time:02:30 PM to 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 various losses of the dc machine. **07**  
(b) State the working principle of dc generator. Explain different parts of dc generator with neat sketches. **07**
- Q.2** (a) Explain the theory of production of rotating field in three-phase induction motor with three-phase supply. **07**  
(b) Derive EMF equation of a transformer. Prove the core loss is practically same under all load condition. **07**
- OR**
- (b) Discuss the necessity of starter. Explain the three-point starter with neat diagram. **07**
- Q.3** (a) Define pitch factor and distribution factor. Derive the equation of the induced EMF for three-phase alternator. **07**  
(b) Explain the internal and external characteristics of DC Shunt Generator. **07**
- OR**
- Q.3** (a) Draw and explain the equivalent circuit of 1- $\Phi$  transformer. **07**  
(b) Explain the Swinburne's test of dc motor. **07**
- Q.4** (a) Explain auto transformer starter of 3- $\Phi$  induction motor with neat diagram. **07**  
(b) Explain the voltage regulation by synchronous impedance in alternator **07**
- OR**
- Q.4** (a) Explain the regulation of 1- $\Phi$  transformer in detail with necessary diagrams. **07**  
(b) State the working principle of dc generator. Derive the equation of generator EMF. **07**
- Q.5** (a) Explain the construction and working of all day efficiency of Single Phase Transformer. **07**  
(b) Explain the construction and working of Schrage motor with neat diagram. **07**
- OR**
- Q.5** (a) Explain the construction and working AC servomotor **07**  
(b) Explain the working principle of single-phase repulsion motor with necessary diagram. **07**

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