



**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-IV (OLD) - EXAMINATION – SUMMER 2018**

**Subject Code: 142401**

**Date: 19/05/2018**

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

**Time: 10:30 AM to 01:00 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 working principle of DC generator and derive the equation for generated emf. **07**  
(b) Explain different parts of dc generator with neat sketches. **07**
- Q.2** (a) Why starter is necessary in DC Motor? Explain the working of three point starter with neat diagram. **07**  
(b) Explain the internal and external characteristics of DC Shunt Generator. **07**
- OR**
- (b) Enlist various methods of speed control for DC shunt motor. Explain any two in detail. **07**
- Q.3** (a) Explain the construction and working principle of three phase induction motor. **07**  
(b) Derive the equation of the starting torque and the condition for maximum torque under running condition for 3- $\Phi$  induction motor. **07**
- OR**
- Q.3** (a) Explain the theory of production of rotating magnetic field in IM with 3- $\Phi$  supply. **07**  
(b) Discuss various methods of measurement of slip for IM. **07**
- Q.4** (a) Derive EMF equation of a transformer. Prove the core loss is practically same under all load condition. **07**  
(b) Explain the equivalent circuit of single-phase transformer. **07**
- Q.4** (a) Explain the short circuit test of 1- $\Phi$  transformer. State the reason for transformer rating in KVA. **07**  
(b) List the conditions for the parallel operation of 1- $\Phi$  transformers. **07**
- Q.5** (a) Explain the parallel operation of 3- $\Phi$  Alternator. **07**  
(b) Explain the repulsion principle with the help of neat sketches. **07**
- OR**
- Q.5** (a) Explain the construction and working of Schrage motor with neat diagram. **07**  
(b) Explain the zero power factor methods for finding the voltage regulation of 3- $\Phi$  alternator. **07**

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