

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III(OLD) EXAMINATION – SUMMER 2019****Subject Code: 131701****Date: 11/06/2019****Subject Name: Electrical Machines****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 different losses in transformer and derive the expression for condition for maximum efficiency of transformer. **07**  
 (b) Explain the working principle of 1-phase transformer under no-load condition with vector diagram. **07**
- Q.2** (a) What is cogging and crawling? Differentiate between slip ring induction motor and squirrel cage induction motor. **07**  
 (b) An ideal 25KVA transformer has 500turns on the primary winding and 40turns on secondary winding. The primary is connected to 3000V, 50Hz supply. Calculate: 1.primary and secondary currents on full load 2. Secondary EMF 3.maximum core flux. **07**
- OR**
- (b) What is slip? Explain torque-slip characteristics of 3-phase induction motor. **07**
- Q.3** (a) Explain the working principle, construction and applications of capacitor start capacitor run induction motor. **07**  
 (b) Describe the construction and working of a double-cage induction motor. **07**
- OR**
- Q.3** (a) List out starting methods of poly phase induction motor. Explain any one method in detail. **07**  
 (b) Explain No-load and Blocked rotor test on three phase induction motor. **07**
- Q.4** (a) Explain Swinburne's test of DC machine. **07**  
 (b) Explain different type of DC generator according to its field winding. **07**
- OR**
- Q.4** (a) Explain ZPF method for finding regulation in Alternator. **07**  
 (b) Explain the operating principle of synchronous motor. And also explain why synchronous motor is not started? **07**
- Q.5** (a) Explain hunting effect in synchronous motor. **07**  
 (b) What is the elementary concept of rotating machines? Explain electromechanical conversion. **07**
- OR**
- Q.5** (a) Define (i) Pitch factor. (ii) Distribution factor for alternator **07**  
 (b) An 8 pole armature has 96 slots with 8 conductors per slot. It is driven at 600 RPM. The useful flux per pole is 10mwb. Calculate the induced emf in armature winding when it is: (1) lap connected (2) wave connected. **07**

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