

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2018****Subject Code:130904****Date:05/12/2018****Subject Name:Electrical Machines-I****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 construction of dc machine **07**
(b) Explain torque-slip characteristics of three phase induction motor **07**
- Q.2** (a) Explain the voltage build up process of dc shunt generator **07**
(b) Derive armature torque and shaft torque equation of dc motor **07**
- OR**
- (b) State different methods of speed control of dc motor. Explain Ward leonard method **07**
- Q.3** (a) Explain three point starter **07**
(b) Explain working principle of three phase induction motor **07**
- OR**
- Q.3** (a) Explain various methods of measurement of slip of three phase induction motor **07**
(b) 3-phase ,50-Hz ,8-pole , induction motor has full-load slip of 2%. The rotor resistance and stand still rotor-reactance per phase are 0.001 ohm and 0.005 ohm respectively. Find the ratio of the maximum to full - load torque and the speed at which the maximum torque occurs. **07**
- Q.4** (a) Explain working principle of transformer at no load and loaded condition **07**
(b) Explain autotransformer **07**
- OR**
- Q.4** (a) Discuss the conditions for parallel operation of transformer **07**
(b) Explain open circuit and short circuit test of transformer **07**
- Q.5** (a) Explain distribution factor and pitch factor **07**
(b) Explain synchronous impedance method to determine the voltage regulation of alternator **07**
- OR**
- Q.5** (a) Discuss conditions of parallel operation of synchronous generator **07**
(b) Explain MMF method to determine the voltage regulation of alternator **07**
