

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 131901****Date: 13/06/2017****Subject Name: Electrical Machines and Electronics****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) State and explain the function of various parts of DC Generator. **07**
(b) Explain the working principal of Single Phase Transformer. Also Explain the difference between core type and shell type transformer. **07**
- Q.2** (a) State the various method of speed control of DC series Motor and Explain any one method in detail. **07**
(b) Sketch and explain the speed-current, speed-torque and torque-current characteristics of a d.c. shunt motor. **07**
- OR**
- (b) A 200 V d.c.shunt motor running at 1000 rpm takes an armature current of 17.5 A. It is required to reduce the speed to 600 r.p.m. What must be the value of resistance to be inserted in the armature circuit if the original resistance is 0.4 Ω ? Take armature current to be constant during this process. **07**
- Q.3** (a) Why starters are used in d.c. shunt motors? Explain 3-point starter with neat diagram. **07**
(b) A single-phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60 cm². If the primary winding be connected to a 50 Hz supply at 520 V, calculate the voltage induced in the secondary winding and the peak value of flux density in the core. **07**
- OR**
- Q.3** (a) Explain different methods of speed control of three phase induction motor. **07**
(b) What are the conditions to be fulfilled for parallel operation of two synchronous machines? Give any one method of synchronizing. **07**
- Q.4** (a) What is power factor? Discuss the disadvantages of low power factor. **07**
(b) Explain Comparison of DC and AC transmission system. **07**
- OR**
- Q.4** (a) What do you mean by tariff? Explain different types of tariff. **07**
(b) Write the name and function of equipment used in a substation. **07**
- Q.5** (a) Explain full wave rectifier circuit. Also compare it with half wave rectifier. **07**
(b) Explain the architecture of 8085 microprocessor. **07**
- OR**
- Q.5** (a) What is an Op-Amp? State various applications of Op-Amp. Also explain the terms CMRR, PSRR and slew rate for practical Op-amp. **07**
(b) Give the symbol Boolean expression and logical operation for the following logic gates:
1) NOT, 2) AND, 3) OR , 4) NAND , 5) NOR ,6) Exclusive OR, 7) Exclusive NOR. **07**
