

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (New) EXAMINATION – WINTER 2015

Subject Code:2130105**Date:29/12/2015****Subject Name: Electrical Machines and Electronics****Time: 2:30pm to 5:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 Give the answer of following. 14**
- 1 Why commutator is employed in DC machine?
 - 2 How will you change direction of rotation of DC Motor?
 - 3 Define armature reaction in DC machines.
 - 4 At which condition efficiency of transformer become maximum?
 - 5 How eddy current losses are minimized in transformer?
 - 6 What happen when DC supply apply to transformer?
 - 7 Define the slip in Induction motor.
 - 8 Why starter is required in 3-phase induction motor?
 - 9 Why 1- phase Induction motor is not self starting?
 - 10 What is the function of capacitor in 1- phase induction motor?
 - 11 Define the voltage regulation terms in Alternator.
 - 12 Write down the EMF equation of Alternator.
 - 13 What is the speed of a 4 pole 50Hz Alternator?
 - 14 Define ripple factor in rectifier.
- Q.2 (a) Only draw the speed-current, speed-torque and torque-current characteristics of a DC shunt motor. 03**
- (b) Explain internal characteristic of DC generator. 04**
- (c) With the help of diagram explain Star Delta starter of 3-phase induction motor. 07**
- OR**
- (c) Explain torque-slip characteristic of 3-phase induction motor. 07**
- Q.3 (a) Explain working principle of transformer. 03**
- (b) Explain method of improvement for power factor. 04**
- (c) With the help of diagram explain three point starter of DC motor. 07**
- OR**
- Q.3 (a) Explain field control method of DC shunt motor. 03**
- (b) Give comparison between AC and DC power transmission. 04**
- (c) Explain brief construction of core and shell type 1-phase transformer. 07**
- Q.4 (a) Write down the condition for synchronization of Alternator. 03**
- (b) Write down merits and demerits of overhead system over underground system for electric supply. 04**
- (c) Explain construction and operation of universal motor. 07**
- OR**
- Q.4 (a) Give the comparison between indoor and outdoor substation. 03**
- (b) Write the name of equipment used in a substation with Symbols. 04**
- (c) Describe various types of tariffs. 07**
- Q.5 (a) Explain NOR and NAND logic gates with their truth table 03**

- (b) Explain De-Morgan's theorem. **04**
- (c) Explain the full wave rectifier in detail with the help of circuit diagram and waveforms. **07**

OR

- Q.5**
- (a) State ideal characteristics of an OP-AMP. **03**
 - (b) Explain single stage CE amplifier with neat circuit diagram. **04**
 - (c) With the help of block diagram explain architecture of 8085 microprocessor. **07**
