

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 150904****Date: 16-01-2013****Subject Name: Element of Electrical Design****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) What are apparent flux density and discuss how to calculate for slotted armature. **07**

(b) Explain four fundamental equations used in design of electromagnet. **07**

Q.2 (a) Derive the steps for calculate the starter resistance for D.C shunt motor. **07**

(b) Discuss design procedure of small single phase transformer. **07**

OR

(b) Find the section resistance of 7 stud field regulator for generator to give limit of 500 and 560 voltages in equal steps. the magnetizing curve is given in fig. The field is 934 ohm. **07**

Q.3 (a) Give the name of various type of wiring used for domestic installation. **07**

(b) Determine the air gap length of a D.C. machine for following data. gross core length=0.1 m, no of ducts=01, width of duct=10mm, slot pitch=24mm, slot width=12mm, Carter's coefficient for slot and ducts=0.3, gap flux density at pole center=0.65T, field MMF per pole=3800A, mmf required for iron part of magnetic circuit=600A **07**

OR

Q.3 (a) Discuss design procedure for welding transformer. **07**

(b) Write all steps to estimate the total cost of electric wiring installation for building **07**

Q.4 (a) What is armature winding? Define following term with respect to it (1) Turn (2) Coil (3) Coil side (4) Single layer winding **07**

(b) Draw the winding diagram in developed form for simplex lap wound 24 slot, 4 pole, and DC armature with 24 commutated segments. **07**

OR

Q.4 (a) Write short answer (1) difference between lap and wave winding (2) dummy coil in context of dc winding (3) equalizer connection in context of dc winding. **07**

Q.4 (b) Draw winding diagram for 4 pole, 24 slot, 3 phase mush connected armature (show only 1 phase) **07**

Q.5 (a) Draw main circuit and control circuit of star delta starter for sq cage induction motor. **07**

(b) State various methods for calculating MMF required for tooth in dc machine. Explain one of them. **07**

OR

Q.5 (a) Explain the load assessment and permissible voltage drop for electrical installation. **07**

(b) Classify various electromagnets give their application briefly; explain construction of flat faced armature type electromagnet. **07**
