Roll No .....

BE - 104

B.E. I & II Semester Examination, December 2014

Basic Electrical & Electronics Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

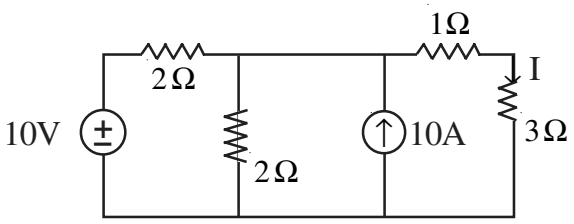
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Write the major difference between:
   i) Ideal voltage source and practical voltage source
   ii) Dependent and independent sources.
   b) Define :
   i) Impedance and
   ii) Phase sequence in a.c. circuit.
   c) Explain with units and
   i) Real power
   ii) Reactive power
   iii) Apparent power in a.c. circuit.
   d) Derive the relation for conversion for star and delta connection.

   Or

   State Thevenin's theorem. Determine the current through a 3Ω resistor branch in the circuit using Thevenin's theorem.



Unit - II

2. a) Define magnetic leakage and fringing.
   b) Give the reason of eddy current loss in transformer core.
   c) Define voltage regulation and efficiency of a transformer. Give the formula also.
   d) Draw the complete phasor diagram of a single phase transformer for an inductive load. Also write the notations used for all voltages and currents used in the phasor diagram.

Or

The results of tests performed on 1ϕ, 20 KVA, 2200/220 volt, 50 Hz. Transformer are as follows-

O.C. test : 220 V, 4.2 A, 148 W

S.C. test : 86 V, 10.5 A, 360 W.

Determine:

The regulation and efficiency at 0.8 p.f. lagging at full load.

Unit - III

3. a) Write the necessity and material used for the following in a d.c. machine
   i) Commutator
   ii) Brush
   b) Why synchronous machine is called as synchronous. Define synchronous speed.
   c) Classify self excited D.C. motor.
   d) Derive the e.m.f. equation of a 3 phase Induction Motor.

Or

Draw and explain the complete Torque-slip characteristics of 3 phase induction motor.

Unit - IV

4. a) State and explain De Morgan's theorem.
   b) Simplify the Boolean function $Z = AB + \overline{A}C + BC$ and therefore design the logic circuit using AND or OR logic gates.
   c) Explain half adder and full adder with truth table.
   d) Explain number systems used in digital electronics.

Or

Explain in detail J-K flip flop.

Unit - V

5. a) Define ideal diode and practical diode.
   b) Differentiate between conductor, semiconductor and insulator with example.
   c) Draw and explain the V-I, characteristic of diode.
   d) Draw the connection diagram and explain the use and working of CE transistor configuration.

Or

Explain the working of BJT. Discuss DC biasing of BJT.

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