Total No. of Questions : 10] [Total No. of Printed Pages : 3

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BE–104

B. E. (First Semester) EXAMINATION, Dec., 2010

(Grading System)

(Common for all Branches)

BASIC ELECTRICALS AND ELECTRONICS ENGINEERING

Time : Three Hours

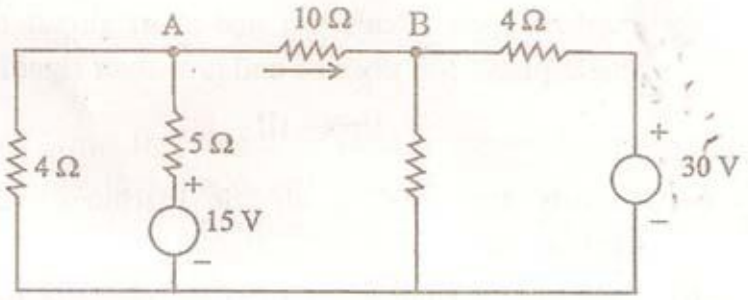
Maximum Marks : 70

Minimum Pass Marks : 22 (D Grade)

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Explain ideal voltage source and ideal current source with neat diagrams. How ideal voltage source can be converted into ideal current source ?

   (b) Using nodal analysis, find the current through the 10 Ω resistor in the figure shown below.



P. T. O.

Or

2. (a) State and explain superposition theorem with the help of an example.

   (b) Establish the relationship between phase and line voltages in a 3-phase star connected circuit.

Unit–II

3. (a) Discuss in brief about the construction and basic principle of operation of transformer.

   (b) Draw and explain the phasor diagram of a single phase transformer under lagging load condition.

Or

4. (a) The following readings were obtained for O.C. and S.C. tests on 8 kVA, 400/120 V, 50 Hz transformer :

   O.C. test (L.V. side) : 120 V, 4 A, 75 W

   S.C. test (L.V. side) : 9·5 V, 20 A, 110 W

   Find :

   (i) The equivalent circuit parameters referred to H.V. side.

   (ii) Efficiency at half load and 0·8 P. F. lagging

   (b) Explain open circuit test and short circuit test of a single phase transformer and give their significance.

Unit–III

5. (a) Classify the rotating electric machines with their applications.

   (b) Explain the concept of rotating magnetic field in a 3-phase induction motor.

Or

6. (a) An 8-pole wave connected D.C. generator has 900 armature conductors and flux per pole of 0·04 Wb. At what speed it must be driven to generate 500 V ?

   (b) Explain the working principle and construction of D.C. machine.

Unit – IV

7. (a) What is octal number system ? How will you convert :

   (i) An octal number into decimal number

   (ii) Decimal number into octal number ?

   Explain with an example.

   (b) Using 2's complement substract $(100111)_2$ from $(110011)_2$.

Or

8. (a) Define NAND and NOR gate and give their truth tables.

   (b) What is a Half Adder ? How is it realised using logic gates ?

Unit – V

9. (a) What do you understand by intrinsic and extrinsic semi-conductors ?

   (b) Discuss the behaviour of P-N junction diode under forward and reverse biasing.

Or

10. (a) Draw the circuit of various transistor configurations. List their important features.

    (b) What do you understand by transistor biasing ? Give its importance.