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CS/B.TECH/SEM-2/EE-201(O)/2011

2011
BASIC ELECTRICAL ENGINEERING

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) The venin's theorem can be applied to network containing

      a) passive elements only b) active elements only

      c) linear elements only d) all of these.

   ii) The number of circuits required to solve a network using super position theorem is equal to the number of

      a) nodes

      b) branches

      c) voltage sources

      d) voltage plus current sources.

iii) The force of attraction produced by on electromagnet is a function of

a) B^2 b) A

c) μO d) all of these.

iv) With an increase on frequency, inductive reactance increases line only & the current

a) remains constant b) decrease inversely

c) increase inversely d) increases line only.

v) In a parallel RC circuit, the equivalent admittance of the circuit in

a) $\frac{1}{R} + jwc$ b) $\frac{1}{R} - jwc$

c) $R + \frac{1}{jwc}$ d) $R + jwc$.

vi) In a three phase system, the phase sequence in used to indicate the

a) amrtitude of the phase voltage

b) frequency of the phase voltage

c) Order in which the phase voltage attain there maximum values

d) Phase angle between phase voltages.

vii) In a transformer which of the following can be classified as core loss ?

a) kysteresis loss

b) eddy current loss

c) copper loss due to current in the windings

d) all of these.

viii) What is done to balance the mmf setup due to the secondary current ?

a) The primary voltage in increased

b) The core flux increase immediately

c) The current in the primary increases

d) all of these.

ix) Which of the following types of winding is used for the stator of a three phone induction motor ?

a) Lap winding

b) Wave winding

c) distributed ac star/delta connected

d) concentrated.

x) In the star delta starter the voltage applied across the stator winding in

a) equal to the supply voltage

b) $\sqrt{3}$ times the supply voltage

c) $1/\sqrt{3}$ times the supply voltage

d) $2/\sqrt{3}$ times the supply voltage.

xi) The flux produced by the field winding in a dc machine

a) rotates at a synchrosions speed with respect to the stator.

b) rotates at a speed less than the synchrosions speed with respect to the stator.

c) rotates at a speed higher than the synchrosions speed with respect to stator.

d) is stationary will respect to stator.

xii) When compound with an electric circuit which of the following parameters in a magnetic circuit are analogous ?

a) current & flux

b) electric field strength & magnetic field strength

c) voltage drop & mmf drop

d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Define the following terms.

a) Electric flux

b) Electric flux density

c) Electric potential

d) Electric potential difference

e) Dieletric strength.

3. Define average value of alternating quantity & derive its expression for sinusoidal current.
4. Define the efficiency & voltage regulation of a transforms at a given load.
5. Derive the relationship between the line current & phase current, line voltage & phase voltage for a balanced there phase star connected inductive load connected across there phase supply.
6. Explain the principle of operation of a three phase induction motor.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Find V_{DF} & V_{AG} for the following circuit :

   b) Apply the The venin's theorem to calculate current flowing through the AB branch for the following circuit :

8. a) A 50 Hz, rserrisoid voltage applied to a single phase circuit 4m RMs value of 200v. Its value of f = 0 is $\sqrt{2}$ volt positive. The current drawn by the circuit is 5 amp (RMS) &
9. Discuss the role and responsibility of DGCA for the smooth functioning of Indian Civil Aviation Industry.
10. "In spite of large potentials for cruise tourism, the Indian cruise tourism market scenario is very poor". Discuss ?

11. What are the different types of rail tours available in India ?