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2011 BASIC ELECTRICAL ENGINEERING

Time Allotted: 3 Hours Full Marks: 70

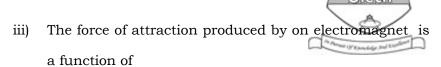
The figures in the margin indicate full marks.

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.

2002 [Turn over



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 de 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.

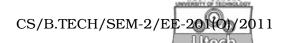
GROUP - B

(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.

2002 4



- 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

2002 6