22215

21718

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define Faraday's first law of electromagnetic induction.

b) Define:

(i) Form factor

(ii) Peak factor

c) Draw 3-phase voltage waveform of a.c. supply with respect to time.

d) State working principle of transformer.

e) Write two applications of D.C. series motor.

f) List different types of stepper motor. State one application of stepper motor.

g) State function of ELCB.

Marks

2. Attempt any THREE of the following: **12**

a) Explain with neat diagram series and parallel magnetic circuits.

b) Explain the concept of lagging and leading phase angle by waveform.

c) Draw delta connected load. Sate relation between:

(i) Line voltage and phase voltage

(ii) Line current and phase current

d) List the main parts of DC motor. Give the function of any two parts.

3. Attempt any THREE of the following: **12**

a) Explain dynamic and static induced emf. with neat diagram.

b) Compare autotransformer with two winding transformer (any four points).

c) Draw and explain split phase induction motor.

d) Give the working of MCCB.

4. Attempt any THREE of the following: **12**

a) Find relactance, flux, mmf, required and exciting current for an iron ring with 200 turns having diameter of 15 cm and 10 cm^2 cross sectional area if flux density 1 wb/m^2 and permeability of 500.

b) Draw schematic diagram of long shunt DC compound motor. Give one application.

c) Explain in brief the working of universal motor.

d) With neat sketch give the working of shaded pole induction motor.

e) Give the function of fuse and switch.

Marks

5. Attempt any TWO of the following: **12**

a) An alternating voltage is represented by $V = 50.5 \sin(314t + 90)$. Calculate frequency, amplitude, RMS value and phase difference.

b) A balanced 3-ϕ star connected load consist of three resistances each of four Ohm's connected to 400 V, 3 phase 50 Hz supply, find:

(i) Phase voltage

(ii) Phase current

(iii) Line current

(iv) Power consumed

c) 20 kVA, 3300/240 V, 50 Hz single phase transformer has 80 turns on secondary winding. Calculate number of primary winding turns, full load primary and secondary currents and maximum value of flux in the core.

6. Attempt any TWO of the following: **12**

a) Draw schematic diagram of capacitor start capacitor run induction motor. Give any two applications of the same.

b) What is earthing? Give the importance of earthing.

c) Write two applications of each of the following:

(i) Fuse

(ii) MCB

(iii) MCCB