23242

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) 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 Magnetomotive force and state its unit.

(b) State any two advantages of AC over DC.

(c) Define three phase balanced and unbalanced load.

(d) State an emf equation of single phase transformer and write the meaning of each term in the equation.

(e) List the different losses occurred in the transformer.

(f) Lis the applications of shaded pole induction motor.

(g) List the types of earthing.

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

(a) Compare Magnetic circuits and Electric circuits on any four points.

(b) Draw the circuit diagram of purely resistive ac circuit. Draw its phasor diagram. Write the equations and draw waveforms for its voltage and current.

(c) Write the advantages of three phase system over single phase system.

(d) Explain construction and working of two windings transformer with neat diagram.

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

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

(b) Define :

(i) Apparent power

(ii) Active power

(iii) Reactive power

And Draw the power triangle.

(c) Compare autotransformer with two windings transformer.

(d) Explain in brief the working of universal motor.

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

(a) An iron ring of mean length 50 cm has 500 turns of windings. The relative permeability of iron is 600. When the current of 3A flows in the windings, determine the flux density.

(b) Write any two applications of (i) DC shunt motor (ii) DC series motor

(c) Explain the working of split phase induction motor with neat diagram.

(d) State any two applications of

(i) Universal motor

(ii) Stepper motor

(e) State the necessity of fuse. List the types of fuses.

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

(a) A sinusoidal voltage with equation V = 25 sin (314 t + 60°) is applied to a load. Calculate

(i) Maximum voltage

(ii) RMS voltage

(iii) Average voltage

(iv) Phase angle

(v) Time period

(vi) Frequency

(b) Three identical coils each having a resistance of 20 ohm and inductance of 0.3 H are connected in star across a 440 V, 50 Hz, 3 phase ac supply. Find

(i) Phase current

(ii) Line current

(iii) Phase voltage

(iv) Line voltage

(v) Power factor

(vi) Total power consumed

(c) Draw the constructional diagram of DC motor and also explain the function of following parts :

(i) Yoke

(ii) Field windings

(iii) Armature windings

(iv) Brushes

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

(a) List the types of stepper motor. Explain working of any one type with neat sketch.

(b) Write two applications of each of following :

(i) Fuse

(ii) MCB

(iii) MCCB

(c) With neat sketch, explain the working of ELCB. Write its any two applications.
