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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 term :

(i) Permeability

(ii) Reluctance

(b) State the significance of power factor.

(c) State the relationship between line and phase value for 3 phase star connection.

(d) State the EMF equation of transformer.

(e) Write any four main parts of dc motor.

(f) State the types of single phase induction motors.

(g) List any two factors that affect on earth resistance.

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

(a) Explain Faraday's law of electromagnetic induction.

(b) State the concept of lagging and leading phase difference with the help of waveforms.

(c) Draw a balanced 3-phase star connected load. Show various line and phase quantities on it.

(d) Compare Autotransformer and two winding transformer with respect to
- (i) Number of winding
- (ii) Symbol
- (iii) Copper saving
- (iv) Application

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

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

(b) 10 kVA, 2200/200 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.

(c) Draw and explain split phase induction motor.

(d) Write any two applications of each of the following :
- (i) Fuse
- (ii) MCCB

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

(a) Draw and explain B-H curve for magnetic material.

(b) Draw schematic diagram of dc series and shunt motor. Also give the application of both motors.

(c) Explain principle of operation of shaded pole motor with neat diagram.

(d) Write any two applications of following motor :

(i) Universal motor

(ii) Stepper motor

(e) Write any four major points related to rewireable fuse.

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

(a) An alternating voltage is represented by V = 50 sin 628 t. Calculate frequency, amplitude, rms value, average value, form factor and peak factor.

(b) Three similar coils each of resistance 20 Ω are connected in delta to a 3-phase 415 V, 50 Hz supply. Calculate phase current, phase voltage, line current, line voltage, total line and phase power.

(c) A single phase 2 kVA, 200V/100V transformer used in a laboratory. Calculate :

(i) Primary winding current

(ii) Secondary winding current

(iii) Turn ratio

(iv) Voltage ratio

(v) Current ratio

(vi) Transformation ratio

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

(a) Explain principle of operation of permanent capacitor motor with neat diagram. Also state any four applications of permanent capacitor motor.

(b) State meaning of earthing and importance of earthing. Also explain any one type of earthing used in electrical installation.

(c) Explain with neat diagram, operation of ELCB and two applications.
