22215

12526

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

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

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(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) State Fleming's Right Hand Rule.

b) Define :

i) Cycle

ii) Frequency

c) Give the meaning of phase sequence of three phase AC supply.

d) State the emf equation of transformer and meaning of each notation on it.

e) Write two application of auto transformer.

f) Define FHP motor.

g) List two factors that affect earthing.

Marks

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

a) Draw and explain BH curve of magnetic material.

b) When sinusoidal voltage is applied to a circuit containing capacitor only –

i) Draw circuit diagram

ii) Write equation for voltage and current

iii) Draw waveform of voltage and current

iv) Draw phasor diagram.

c) Compare star and delta connection on basis –

i) connection diagram

ii) neutral

iii) line and phase current

iv) line and phase voltage

d) Explain losses occuring in transformer.

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

a) Compare magnetic circuit and electric circuit on any four point.

b) State the principle of operation of DC motor. Write the application of following motor.

i) DC series motor

ii) DC shunt motor

c) Draw and explain split phase induction motor.

d) Explain the working principle of fuse and write it's function.

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

a) A coil of 500 turns and resistance of 20 Ω wound uniformly on iron ring of circumference 50 cm and cross sectional area of 4 cm^2. It is connected to 24 V dc supply. Assume relative permeability of material μ_r = 800. Find magneto motive force, magnetic field strength, reluctance and total flux.

Marks

b) A single phase transformer has 200 primary and 600 secondary turns. If primary winding is connected to 300 V, 50 Hz, 1ϕ supply. Calculate :

i) Maximum flux in core

ii) Emf induced in secondary

c) Explain principle of operation of universal motor with neat diagram.

d) Explain why single phase induction motor is not self starting ? List different types of 1ϕ induction motor.

e) Write any four IE rule relevant to earthing.

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

a) In AC circuit supply voltage is given by V = 200 sin 314t. Calculate –

i) Maximum value

ii) RMS value

iii) Frequency

iv) Time period

v) Angular frequency

vi) Peak factor

b) Three similar coil each of having 3Ω resistance and 4Ω inductive reactance in series are connected in star across a 3 phase, 400 V, 50 Hz ac supply. Determine

i) Phase current

ii) Line current

iii) Power factor

iv) Total power

c) Draw constructional diagram of DC motor and write the function of following :

i) Yoke

ii) Field winding

iii) Pole & Pole shoe

Marks

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

a) Draw a neat diagram of capacitor start capacitor run indiction motor. State any two application of it.

b) Explain need of earthing in electrical system. State the types of earthing and draw a neat diagram of any one type of earthing.

c) Explain operation of ELCB with neat diagram and state the application of it.