312315

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

Marks

1.   **Attempt any <u>FIVE</u> of the following :**   **10**

a)   Define magnetic flux and state its unit.

b)   Define:

   i)   In phase

   ii)   Out of phase

c)   Define 3ϕ balanced and unbalanced load.

d)   State emf equation of transformer.

e)   Define voltage ratio and current ratio of a transformer.

f)   Write any two application of stepper motor.

g)   State any two methods of reducing earth resistance.

Marks

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

   a) Explain –

      i) Lenz's law

      ii) Flemings right hand rule.

   b) Give the advantages of 3φ over 1φ system.

   c) Compare Autotransformer with two winding transformer.

   d) Compare between a.c. and d.c. supply.

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

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

   b) Write two applications of –

      i) D.C. shunt motor

      ii) D.C. series motor

   c) Explain in brief working of universal motor with neat sketch.

   d) Describe active and reactive power with the help of power triangle.

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

   a) Compare core type and shell type transformer. (Any four)

   b) Explain need of earthing with its advantages.

   c) Draw and explain split phase induction motor.

   d) Explain how direction of rotation of universal motor is reversed.

   e) For a purely resistive circuit –

      i) Draw neat sketch

      ii) Draw waveform of voltage and current

      iii) Write equation of current

      iv) Phasor diagram.

Marks

5. Attempt any TWO of the following : 12

a) The voltage equation of an a.c. system is given by
v = 100 sin 314 t.

Find :

i) Maximum value

ii) Frequency

iii) RMS value

iv) Average value

v) Form factor

vi) Peak factor

b) Draw the construction diagram of DC motor and also explain the function of –

i) Yoke

ii) Brushes

iii) Armature

iv) Commutator

c) Write two application of each –

i) Fuse

ii) MCB

iii) MCCB

6. Attempt any TWO of the following : 12

a) State the function of fuse. Explain switch fuse unit and fuse switch unit.

b) Explain the principle of operation of capacitor start capacitor run motor with neat diagram. Also state its application.

Marks

c) A coil of 500 turns wound uniformly on an iron ring of mean circumference 50 cm and cross sectional area of $4/\pi \, cm^2$ carries a current of 1A. Find :

    i)   MMF

    ii)   Field strength

    iii) Reluctance

    iv) Flux

    v)   Flux density

    vi) Permeance

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