

22215

12425

3 Hours / 70 Marks

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

5 × 2 = 10

- (a) Define Dynamically & statically induced emf.
- (b) Define frequency & time. Give relation between them.
- (c) Draw the waveform representation of a three phase [3 ϕ] ac supply with neat labels.
- (d) State the difference between stepup & stepdown transformer. (Any two points)
- (e) Define FHP Motor.
- (f) Define Fuse. List two types of fuse.
- (g) Write any four factors affecting earthing.

2. Attempt any THREE :

3 × 4 = 12

- (a) Compare Electric circuit & Magnetic circuit on any four points.
- (b) Explain pure inductive circuit across AC supply with neat circuit diagram, wave forms & voltage, current equations.



- (c) Explain balanced & unbalanced load with diagrams.
- (d) Draw schematic diagram of following motor :
 - (i) DC shunt motor
 - (ii) DC series motor

3. Attempt any THREE :**3 × 4 = 12**

- (a) State Faraday's Laws of electromagnetic induction.
- (b) Define Apparent power, True power, Reactive power, Power factor of an ac circuit. State unit of each.
- (c) Draw schematic representation of capacitor start, capacitor run induction motor also list its two applications.
- (d) Compare Fuse & MCB on the basis of (i) application (ii) operation (iii) safety (iv) cost

4. Attempt any THREE :**3 × 4 = 12**

- (a) Draw neat diagram of Series & parallel magnetic circuits.
- (b) Compare two winding transformer & Auto transformer. (Any four points)
- (c) Explain principle of operation of universal motor with neat diagram.
- (d) Define Earthing. State the need of earthing in electrical system. Give its types.
- (e) Give the advantages of 3 ϕ ac supply over 1 ϕ ac supply.

5. Attempt any TWO :**2 × 6 = 12**

- (a) An alternating voltage given by equation $v = 142 \sin 628 t$, find.
 - (i) Maximum value
 - (ii) Time period
 - (iii) RMS value
 - (iv) Average value
 - (v) Form factor
 - (vi) Peak factor

- (b) Write any **two** application of each of the following :
- (i) ELCB
 - (ii) MCB
 - (iii) MCCB
 - (iv) Fuse
- (c) A 1 ϕ 1.5 kVA, 230/110 transformer used in a laboratory, Calculate
- (i) Primary winding current
 - (ii) Secondary winding current
 - (iii) Turns Ratio
 - (iv) Current Ratio

6. Attempt any TWO :

2 $\times$ 6 = 12

- (a) Three similar coils each of resistance 20Ω & an inductance of 0.5 H are connected in star to a 3 ϕ , 440V, 50 Hz supply system. Calculate the Phase current, Line current, Line voltage, Phase voltage, Total phase power, Total line power.
- (b) Explain the working principle of Stepper motor & explain any one type with neat sketch.
- (c) Define Voltage ratio, Current ratio, Turns ratio, kVA rating of a transformer. Write emf equation of a transformer for primary & secondary winding.
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