

22215

22232

3 Hours / 70 Marks

Seat No.

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- 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 Reluctance and state its unit.
- (b) State the meaning of the terms lagging and leading phase difference.
- (c) State any two advantages of 3- ϕ supply system over 1- ϕ supply system.
- (d) State the working principle of Transformer.
- (e) Define voltage ratio and current ratio of a transformer.
- (f) Give classification of 1- ϕ induction motor.
- (g) State the function of ELCB.

2. Attempt any THREE of the following :

12

- (a) State and explain Faraday's Laws of Electromagnetic Induction.
- (b) Describe active and reactive power with the help of power triangle.



- (c) Explain 3- ϕ balanced and unbalanced load concept in a 3 phase system.
- (d) Explain the losses occurring in a transformer.
- 3. Attempt any THREE of the following : 12**
- (a) State and explain Fleming's right Hand rule.
- (b) Explain the construction and working of 1- ϕ Autotransformer.
- (c) Explain the working of universal motor with neat sketch.
- (d) Describe the working of MCCB. List types of earthing.
- 4. Attempt any THREE of the following : 12**
- (a) Distinguish between Electric and Magnetic circuit.
- (b) A 1- ϕ transformer has 375 turns on the input side and 1050 turns on the output side. The transformer is connected to a 400 V, 50 Hz ac supply. The net cross sectional area of the core is 40 cm². Find the current and voltage developed across the secondary side of the transformer.
- (c) Explain the working of capacitor start induction motor with neat circuit diagram.
- (d) Explain variable reluctance stepper motor.
- (e) Explain the need of earthing in an electrical system with its advantages.
- 5. Attempt any TWO of the following : 12**
- (a) Three identical coils each having resistance of 15 Ω and an inductance of 0.03 H are connected in delta across 400 V, 50 Hz ac supply. Determine :
- | | |
|---------------------|---------------------------|
| (i) Phase current | (ii) Line current |
| (iii) Phase voltage | (iv) Line voltage |
| (v) Power factor | (vi) Total power consumed |

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

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|------------------------|--------------------|
| (i) Yoke | (ii) Field winding |
| (iii) Armature winding | (iv) Brushes |

(c) The Vtg. equation of an ac system is given by

$$V = 100 \sin 314 t \text{ find:}$$

- | | |
|-----------------|--------------------|
| (i) Max. value | (ii) Frequency |
| (iii) RMS value | (iv) Average value |
| (v) Form factor | (vi) Peak factor |

6. Attempt any TWO of the following :

12

- (a) Explain the working of shaded pole induction motor. State the applications of it.
- (b) State the function of fuse and also classify it. Explain switch fuse unit and fuse switch unit.
- (c) Explain with neat diagram, the operation of MCB and also explain advantages of MCCB.
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