

22538

23124

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 of the following :

10

- (a) Write any two applications of universal motor.
- (b) State the starting methods of an induction motor.
- (c) State any four specifications of stepper motor.
- (d) Draw a neat circuit diagram of 1 ϕ half-wave converter.
- (e) State any four applications of DC servo motor.
- (f) State the need of electric drives.
- (g) State any four applications of stepper motor.



- 2. Attempt any THREE of the following : 12**
- (a) Describe the operation of rotor resistance control of 3 ϕ induction motor with neat circuit diagram.
 - (b) Explain the operation of 1 ϕ semi-converter with neat circuit diagram and waveforms.
 - (c) State any eight functions of microprocessor / microcontroller based control for drives.
 - (d) Describe the operation of PLL control of DC shunt motor with neat sketch.
- 3. Attempt any THREE of the following : 12**
- (a) State the sequences of the stages and drives required for paper mill.
 - (b) State the sequences of the stages and drives required in any stage for textile mill.
 - (c) Describe the stepper motor drive using microcontroller with neat sketch.
 - (d) Give the operation of 1 ϕ resistance split phase induction motor with neat schematic diagram.
- 4. Attempt any THREE of the following : 12**
- (a) Explain with neat diagram the operation of stator voltage control of 3 ϕ induction motor.
 - (b) State the sequences of the stages and drives required in any stage of steel rolling mills.
 - (c) Explain with neat sketches the working of the single phase DC motor drive using microcontroller.
 - (d) Explain with neat sketches the working of 3 ϕ induction motor.
 - (e) Draw the neat diagram of AC servo motor and list any two applications.

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

- (a) Draw the circuit diagram and input-output voltage and load current waveforms for single phase full converter to control the speed of DC series motor.
- (b) Draw the neat circuit diagram of 3 ϕ half wave converter and explain its working.
- (c) Explain the braking methods of 3 ϕ induction motor with neat diagram.

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

- (a) Draw the neat circuit diagram of 1 ϕ dual converter and explain its working with quadrant diagram.
 - (b) Draw the electrical circuit diagram of DC series, shunt and compound motor and state any two applications of each type of motor.
 - (c) Describe with sketches working of the 3 ϕ Im solar powered pump drives used for lift irrigation.
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