

22538

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.

Marks

1. Attempt any FIVE of the following :

5 × 2 = 10

- (a) List any four applications of squirrel cage induction motor.
- (b) State the types of single phase AC motors.
- (c) State the functions of microcontroller in speed control of drives.
- (d) Draw neat diagram of chopper control DC drives.
- (e) State the need of electric drives.
- (f) Draw neat block diagram of DC servomotor.
- (g) List four applications of stepper motor.

2. Attempt any THREE of the following :

3 × 4 = 12

- (a) Draw and explain the operation of variable frequency control of three phase induction motor.
- (b) Explain the operation of universal motor with neat diagram.
- (c) With the help of block schematic, explain the operation of phase locked loop for speed control of DC motor.
- (d) Draw block diagram of synchronous motor drive and state the function of each block.



- 3. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Describe the operation of stator voltage control of three phase induction motor with neat circuit diagram.
 - (b) State the sequences of the stages and drives required in each stage of textile mill.
 - (c) Explain with neat diagram, the working of single phase AC motor drive using microcontroller.
 - (d) Compare AC drives and DC drives (any four points).
- 4. Attempt any THREE of the following :** **3 × 4 = 12**
- (a) Explain the operation of rotor resistance control of three phase induction motor.
 - (b) List the number of stages involved in paper mill with the type of drives / motor used at each stage.
 - (c) Describe the stepper motor drive using microcontroller with neat sketch.
 - (d) Give the constructional details of shaded pole motor with neat diagram.
 - (e) Explain the functional block diagram of an electric drives with neat diagram.
- 5. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Draw the neat circuit diagram of reversible SCR drive using single phase dual converter and explain its working.
 - (b) Explain the operation of three phase half wave converter with neat diagram and waveforms.
 - (c) Describe with neat diagram the starting and braking method of the three phase slip ring induction motor.
- 6. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Compare single phase and three phase SCR Drives (any six points).
 - (b) Draw the electrical circuit diagrams of DC series, shunt and compound motors and also give two applications of each type of motor.
 - (c) Identify the type of Chopper used for forward motoring and forward braking of DC shunt motor. Describe its working with neat circuit diagram and waveforms.
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