22538

**12425**

**3 Hours / 70 Marks** Seat No. | | | | | | | | |

***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.

**Marks**

**1. Attempt any FIVE of the following :** **10**

(a) State any four applications of – universal motor.

(b) State any four ratings of stepper motor.

(c) State any four applications of shaded pole motor.

(d) Draw neat diagram of single phase full converter.

(e) Draw electrical diagram of DC series motor.

(f) State any four applications of compound motor.

(g) Write any four advantages of microprocessor based drives.

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

(a) Explain the operation of rotor resistance control of three phase induction motor.

(b) Draw and explain chopper controlled DC Drive.

(c) Draw only the block diagram of control of DC motor using microprocessor.

(d) Describe the stepper motor drive using microcontroller with neat sketch.

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

(a) Explain with neat diagram stator voltage control of 3 phase IM.

(b) Explain with neat diagram V/F control of 3 phase IM.

(c) Draw only the block diagram of microprocessor based synchronous motor drive.

(d) Explain with neat diagram the working of capacitor start single phase AC motor.

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

(a) State the sequence of stages and drives required in each stage of sugar mill.

(b) State the braking methods of induction motor. Explain any one method with neat diagram.

(c) Draw and explain the working of PLL based DC Drive.

(d) State starting methods of induction motor. Explain any one of them.

(e) Draw the block diagram of basic element of drive. Explain each block in short.

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

(a) Draw only the circuit diagram of 3 phase dual converter.

(b) Draw neat diagram of single phase semi-converter to control speed of DC motor. Explain its working with voltage and current waveforms.

(c) Draw electrical circuit diagram of single phase resistance split AC motor. Explain its working. State any two applications of it.

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

(a) Draw and explain reversible SCR drive.

(b) Draw electrical circuit diagram and speed V/S torque characteristics of DC shunt motor. Explain why it is called as constant speed (constant flux) motor.

(c) State the sequence of stages and drives required in each stage of textile mill.