

**Scheme – I**  
**Sample Question Paper**

**Program Name** : Diploma in Industrial Electronics  
**Program Code** : IE  
**Semester** : Fifth  
**Course Title** : AC and DC Drives  
**Max. Marks** : 70

22538

**Time : 3 Hrs.**

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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) Preferably, write the answers in sequential order.

**Q.1 Attempt any FIVE of the following.**

**10 Marks**

- a) Write any two applications of AC servo motors
- b) State the braking methods of induction motor.
- c) Write any four advantages of microprocessor based control DC drives.
- d) Draw a neat diagram of chopper control DC drive.
- e) State any four applications of universal motor.
- f) State any four applications of brushless DC motor.
- g) State any four applications of stepper motor.

**Q.2 Attempt any THREE of the following.**

**12 Marks**

- a) Describe the operation of stator voltage control three phase induction motor with neat circuit diagram.
- b) Explain the operation of single phase full wave converter with neat circuit diagram and waveforms.
- c) Describe the advantage and disadvantages of synchronous motor drives
- d) Describe the operation of PLL Control of DC shunt motor with neat sketch.

**Q.3 Attempt any THREE of the following.**

**12 Marks**

- a) State the sequences of the stages and drives required in any stage for textile mill.
- b) State the sequences of the stages and drives required in any stage for sugar mill.
- c) Describe the stepper motor drive using microcontroller with neat sketch.
- d) Give the constructional details of shaded pole motor with neat diagram.

**Q.4 Attempt any THREE of the following.**

**12 Marks**

- a) Explain with neat diagram the operation of rotor resistance control of three phase induction motor
- b) Describe with neat diagram the procedure to measure the speed of three phase induction motor by using voltage source inverter control.
- c) Explain with neat sketches the working of the single phase AC motor drive using micro controller.
- d) Explain with neat sketches the working of single phase resistance split AC motor.
- e) Draw the neat diagram of DC servo motor and list any two applications.

**Q.5 Attempt any TWO of the following.**

**12 Marks**

- a) Draw the circuit diagram and input-output voltage and load current waveforms for single phase SCR semi-converter to control the speed of DC series motor.
- b) Draw the neat circuit diagram of reversible SCR drive using dual converter and explain its working.
- c) Explain with neat diagram the starting and breaking method of the three phase squirrel cage induction motor.

**Q.6 Attempt any TWO of the following.**

**12 Marks**

- a) Draw the circuit diagram and input-output voltage and load current waveforms for three phase SCR half wave converter to control the DC shunt motor.
- b) Draw the electrical circuit diagrams of DC series, shunt and compound motors and state any two applications of each type of motor.
- c) Describe with sketches working of the three phase induction motor solar powered pump drives used for the lift irrigation.

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## Scheme – I

### Sample Test Paper - I

**Program Name** : Diploma in Industrial Electronics  
**Program Code** : IE  
**Semester** : Fifth  
**Course Title** : AC and DC Drives  
**Max. Marks** : 20

**22538**

**Time : 1 Hrs.**

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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) Preferably, write the answers in sequential order.

#### Q.1 Attempt any FOUR.

**08 Marks**

- a) State the need of electric drive.
- b) Write any two applications of DC servo motor.
- c) State the braking methods of Induction motor.
- d) Draw a schematic diagram of Resistance split phase motor.
- e) Draw a neat circuit diagram of single phase half wave converter.
- f) Draw the quadrant diagram of single phase dual converter.

#### Q.2 Attempt any THREE.

**12 Marks**

- a) Explain with neat sketch the functional block diagram of an electric drive.
- b) Explain the working of permanent magnet motor with neat sketch.
- c) Give the constructional details of shaded pole motor with diagram.
- d) Describe the operation of three phase induction motor with neat sketch.
- e) Explain the operation of full wave converter with diagram.

## Scheme – I

### Sample Test Paper - II

**Program Name** : Diploma in Industrial Electronics

**Program Code** : IE

**Semester** : Fifth

**Course Title** : AC and DC Drives

**Max. Marks** : 20

**22538**

**Time : 1 Hrs.**

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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) Preferably, write the answers in sequential order.

#### Q.1 Attempt any FOUR.

**08 Marks**

- a) State the types of speed control methods of an induction motor.
- b) State the sequences of stages in paper mills.
- c) Draw a neat diagram of chopper controlled DC drive.
- d) Write any four specifications of Stepper motor.
- e) Write any four advantages of microcontroller/microprocessor based control of DC drives.
- f) State any four functions of microcontroller/microprocessor based control of DC drives.

#### Q.2 Attempt any THREE.

**12 Marks**

- a) Explain the operation of solar powered pump drives with diagram.
- b) Explain with neat diagram the operation of rotor resistance control of induction motor.
- c) Describe the operation of Phase locked loop control of DC motor with neat sketch.
- d) Describe Stepper motor drives using microcontroller with neat sketch.
- e) State the sequences of stages and drives required in each stage for textile mill.