

**'T' Scheme
Sample Question Paper**

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Industrial drives and control
Max. Marks : 70

22629

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1) Attempt any Five of the following. (10 Marks)

- a) Draw block diagram of the Basic elements of electric drives.
- b) State the need of electric drives.
- c) State the types of SCR controlled drives
- d) Draw circuit diagram of half wave converter.
- e) List various methods of control the speed of AC drive.
- f) Draw a block diagram of microprocessor based DC motor controller .
- g) State the function of microprocessor in drives.

Q.2) Attempt any Three of the following. (12 Marks)

- a) Describe the four quadrant operation of induction motor with speed torque characteristics.
- b) Compare semi converter drives and full converter drives on the basis of 1) Quadrant operation 2) Regenerative braking 3) Power flow 4) harmonic contents
- c) Draw and describe class C chopper drive.
- d) Draw the block diagram of constant V to F control method and describe it's working

Q.3) Attempt any Three of the following. (12 Marks)

- a) List the duty class of motor and describe continuous duty class.
- b) Draw the circuit a three phase semiconverter drive. State the equation of average armature voltage.
- c) Draw and describe class D chopper drive
- d) List no of stages involved in paper mill. Which type of motor/drives used at each stage?

Q.4) Attempt any Three of the following. (12 Marks)

- a) Draw and describe the operation of chopper circuit used for reversible drive
- b) State the stages involved in textile mills and type of drives used for it.
- c) Describe the working of variable frequency control using square wave inverter.
- d) Draw labeled block diagram of phase lock loop (PLL) control DC motor drive. State function of each block.
- e) Describe role of microprocessor for speed control of DC motor with neat diagram .

Q.5) Attempt any Two of the following. (12 Marks)

- a) Draw circuit diagram of three phase dual converter using SCR and describe working principle with wave forms
- b) Draw and describe four quadrant chopper drive.
- c) State the rating and specification of stepper motor.

Q.6) Attempt any Two of the following. (12 Marks)

- a) A semi converter operated from single phase 230 volt, 50 Hz supply drives a 10HP, 200 volt, 1500rpm, separately excited DC motor. The rated armature current is 40A, the motor parameters $R_a=0.5\Omega$, $L_a=10\text{mH}$. $K_a\phi$ constant $=0.2\text{V/rpm}$. Find out the following parameters $\alpha = 30^\circ$ i) average armature voltage, ii) back emf of motor iii) speed of motor iv) motor torque.
- b) Classify the chopper based on the output voltage and quadrant of operation. Describe class A chopper with circuit diagram
- c) Describe the stator voltage control method of three phase induction motor with circuit diagram

'T' Scheme
Progressive Test– I Sample Question Paper

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Industrial drives and control
Max. Marks : 20

22629

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(08 Marks)

- a. State the element of electric drive
- b. Draw power circuit of three phase semi converter.
- c. Write the classification of motor duty class.
- d. Draw only circuit diagram of single phase dual converter.
- e. State four functions of electric drives.
- f. Chopper based drives are more preferable to converter based drives, state any two reasons.

Q.2 Attempt any THREE.

(12 Marks)

- a. List different factors for selection of electric drives.
- b. State suitable type of chopper for very large load current requirement, justify with neat sketch.
- c. Compare single phase semi converter drives and full converter drives.
- d. Draw and labeled half wave converter drive using separately excited motor.
- e. List eight industrial applications of drives

'T' Scheme
Progressive Test– II Sample Question Paper

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Industrial drives and control
Max. Marks : 20

22629

Time: 1 Hour

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

(08 Marks)

- a. Draw the circuit diagram of basic chopper using SCR.
- b. State four specification of stepper motor
- c. Compare DC and AC drives(any two points).
- d. List the method of speed control of induction motor.
- e. Draw the circuit diagram of microprocessor based control of synchronous motor.
- f. State the concept of slip power recovery system.

Q.2 Attempt any THREE.

(12 Marks)

- a. List no of stages involved in sugar mill. Which type of motor/drives used at each stage?
 - b. Describe the working of two quadrant operation of DC drives
 - c. List any four functions performed by microprocessor in speed control of industrial drives.
 - d. Describe the working of any one type solar powered pump drive.
 - e. Draw and describe PLL control of DC motor.
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