16117

3 Hours / 100 Marks   Seat No.

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.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any <u>THREE</u> of the following:** **12**

    (i) Write voltage equation and torque equation.

    (ii) Write requirements of adjustable speed drive.

    (iii) Draw and explain block diagram of PLL control of DC motor.

    (iv) Explain 1ϕ full converter drive with a neat diagram.

   b) **Attempt any <u>ONE</u> of the following:** **6**

    (i) Compare AC and DC drive (six points)

    (ii) Explain block diagram of D.C. drive and explain armature voltage control method for D.C. series motor.

2. **Attempt any <u>FOUR</u> of the following:** **16**

   a) Draw schematic of electrical drive.

   b) Enlist drives use in paper mill.

   c) Draw a neat circuit diagram three phase half converter drive.

Marks

   d) Explain slip characteristics of IM.

   e) State the advantages of converter fed instruction motor.

   f) Explain chopper using power MOSFET with a neat circuit diagram.

3.   **Attempt any <u>FOUR</u> of the following:**   **16**

   a) Draw a neat circuit diagram of class C chopper and give its operation.

   b) State the drives used in machine tool applications.

   c) Draw 3 ϕ full converter drive for DC motor and give its operation.

   d) State the need of electric drive.

   e) Draw mechanical and electrical characteristics of DC shunt motor.

4. a) **Attempt any <u>THREE</u> of the following:**   **12**

    (i)   Compare semiconverter with full converter.

    (ii) Write working principle of IM.

    (iii) Draw schematic of speed control of stepper motor by using microprocessor.

    (iv) Give advantages of microprocessor drive.

  b) **Attempt any <u>ONE</u> of the following:**   **6**

    (i)   Explain four quadrant operation of Hoist Load.

    (ii) Explain drives use in Textile mill.

5.   **Attempt any <u>FOUR</u> of the following:**   **16**

   a) Explain 1 ϕ semiconverter drive for speed control of separately excited D.C. motor.

   b) Explain stator voltage control method of IM.

   c) Draw a block diagram of dual converter and give its quadrant diagram.

   d) Write classification of steel rolling mill.

   e) Draw a neat block diagram of microcomputer control of DC motor drive.

   f) Explain rotor resistance control of IM using chopper.

Marks

6. **Attempt any FOUR of the following:** **16**

    a) Compare discrete analog and microprocessor speed control method.

    b) Draw schematic arrangement for speed control of D.C. motor by using microproccessor.

    c) Draw block diagram of constant V/F control method by using square wave inverter.

    d) Explain different drive use in sugar mill.

    e) Draw schematic arrangement of closed loop control method by using PWM inverter for IM.

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