

22643

23242

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.

**Marks**

**1. Attempt any FIVE :**

**10**

- (a) State any four applications of Mechatronics.
- (b) State any two advantages and disadvantages of CNC machine.
- (c) State classification of pneumatic actuators.
- (d) State application of bearing.
- (e) State classification of Robots based on work envelop.
- (f) Distinguish between a Transducer and a Sensor.
- (g) List any four advantages of PLC based car parking system.

**2. Attempt any THREE :**

**12**

- (a) State and explain working of LNDT accelerometer with schematic diagram.
- (b) State electrical system building blocks and explain force voltage analogy.
- (c) Differentiate between pneumatic and hydraulic system.
- (d) Explain hydraulic rotary actuator rotating vane.



- 3. Attempt any THREE :** **12**
- (a) Explain real time mechatronics system Computer Integrated Manufacturing (CIM).
  - (b) Explain single acting and double acting cylinder.
  - (c) State any two advantages and disadvantages of hydraulic system.
  - (d) Describe the concept of degree of freedom in Robot.
- 4. Attempt any THREE :** **12**
- (a) State the principle and working of Tacho-Generator.
  - (b) Give general configuration of CNC system.
  - (c) Describe with sketch :
    - (i) Poppet Valve
    - (ii) Spool Valve
  - (d) State the working principle of cam. List its types. Give any two applications of cam.
  - (e) Draw and explain block diagram of general structure of Robotic Mechanical System.
- 5. Attempt any TWO :** **12**
- (a) Explain Hall Effect Sensor with diagram. State any two advantages.
  - (b) Explain working of CNC drilling machine with neat block diagram. State its advantages and disadvantages.
  - (c) Draw and explain block diagram of hydraulic control system.
- 6. Attempt any TWO :** **12**
- (a) Draw and describe the pyro-electric sensor. State any two applications.
  - (b) Draw and explain block diagram of pneumatic control system.
  - (c) State necessity and explain microcontroller based Antilock Brake System (ABS).
-