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3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions :**
- (1) Answer each next main Question on a new page.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define sensor. Enlist any two sensors.
- (b) Sketch the block diagram of real time mechatronics system.
- (c) State different types of Torque sensors. (any four)
- (d) Draw LVDT accelerometer.
- (e) State any two applications of pneumatic system.
- (f) State different types of gear. Define gear.
- (g) Define end effector. List any two end effector.
- (h) Explain the function of regulator in pneumatic system.

2. Attempt any THREE of the following :

12

- (a) Sketch the diagram of signal conditioner. Explain it.
- (b) State the advantages of CNC machine. Explain G Code and M Code.
- (c) Draw & explain the operation of double acting cylinder.
- (d) State different types of CAM & explain any one.
- (e) Explain degree of freedom with respect to Robot.

- 3. Attempt any THREE of the following :** **12**
- (a) Explain torque measurement using strain gauge method.
 - (b) Explain Hydraulic system with neat sketch.
 - (c) With block diagram explain Computer Integrated Machines (CIM).
 - (d) Draw the diagram of Electro-mechanical system & write the function of each component.
 - (e) Explain the working of tachogenerator.
- 4. Attempt any THREE of the following :** **12**
- (a) Explain the model of translational mechanical system.
 - (b) Draw and explain block diagram of Robot.
 - (c) Define Belt. State different types of belts.
 - (d) Explain the working of load cell with neat diagram.
 - (e) Explain the general configuration of CNC system.
- 5. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Explain Hydraulic system with neat diagram. State its advantages.
 - (b) Draw and explain micro-controller based pick and place robot.
 - (c) State and explain building blocks of electrical system.
- 6. Attempt any TWO of the following :** **2 × 6 = 12**
- (a) Explain the concept of Automated Guided Vehicle (AGV) with block diagram.
 - (b) Explain the function of directional control valve & explain with diagram poppet-valve.
 - (c) Explain the working of hydraulic rotary actuator with neat diagram. Write the types of linear actuator.
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