22643

21222

3 Hours / 70 Marks Seat No. | | | | | | | | |

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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