22232

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.

(4) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) Name any two pressure and position sensor.

(b) State need of signal conditioner in mechatronics.

(c) State advantages and limitations of pneumatic system. (any two)

(d) Draw block diagram of real time mechatronics system.

(e) Enlist any two limitations of Hydraulic System.

(f) Sketch block diagram of Robotic System.

(g) Define degree of freedom and end effectors.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) Enlist acceleration sensor and discuss LVDT with neat sketch.

(b) Sketch electromechanical system and explain it.

(c) Explain basic pneumatics system circuit.

(d) State mechanical motion element. Enlist application of gear.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Describe with sketch torque measurement using stroboscope method.

(b) Define actuator. Discuss Rotary actuators.

(c) Discribe with neat diagram Hydraulic System.

(d) Explain working of pick and place robot.

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) Illustrate various velocity sensor. Describe any one.

(b) List out advantages of CNC machine. Explain G code and M code.

(c) Explain working principal of cams with sketch.

(d) Explain role of mechatronics system in AGV with block diagram.

(e) Enlist constructional features of pneumatic linear actuator.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Explain mechatronics system architecture and list out its application.

(b) Explain CNC based drilling machine.

(c) Draw & describe pappet & spool valve.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) State & explain working principle of "Hall-effect sensor" with sketch.

(b) Describe Hydraulic linear actuator with neat sketch.

(c) Explain in detail microcontroller based antilock break system (ABS).