



22643

12223

3 Hours / 70 Marks

Seat No.

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- 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) Assume suitable data, if necessary.
 - (6) 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 real time mechatronic system.
- (b) State types of optical encoder.
- (c) State the need of signal conditioning.
- (d) Explain the concept of AGV.
- (e) State any two advantages of hydraulic system.
- (f) List applications of Robot.
- (g) State the two types of actuators used in pneumatic system.

2. Attempt any THREE of the following :

12

- (a) Describe the mechatronics system architecture with neat diagram.
- (b) Draw a neat sketch and describe the working of Double Acting Cylinder (DAC).
- (c) Describe the building blocks of translational system.
- (d) State the function of hydraulic filter. State the applications of Spur and Helical gear.



- 3. Attempt any THREE of the following : 12**
- (a) Briefly describe different components of basic pneumatic system.
 - (b) Describe the working principle of hydraulic rotary actuator.
 - (c) Explain pyroelectric sensors.
 - (d) Explain the working principle of microcontroller based ABS system with neat diagram.
- 4. Attempt any THREE of the following : 12**
- (a) State the applications of pneumatic system.
 - (b) Describe constructional features of hydraulic linear actuator.
 - (c) Describe briefly G codes and M codes.
 - (d) Draw and explain operation principle of Photoelectric Sensors.
 - (e) Describe Microcontroller based pick and place Robot.
- 5. Attempt any TWO of the following : 12**
- (a) State the different types of acceleration sensors. Explain Piezoelectric accelerometer working with neat diagram.
 - (b) Draw and explain general configuration of CNC system. State any two advantages of CNC machine.
 - (c) State the function of direction control valves. Explain spool valve with neat diagram.
- 6. Attempt any TWO of the following : 12**
- (a) State the types of CAM. Explain the principle of operation of CAM with neat diagram. State its applications (any two).
 - (b) With neat block diagram explain the working principle of microcontroller based car park barrier system.
 - (c) Explain the working of Hall Effect sensors. State its applications.

