17660

11920

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each Section on same / separate answer sheet.

(3) Assume suitable data, if necessary.

(4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE : **20**

(a) Write any four advantages and disadvantages of mechatronics.

(b) Compare between Electronic and Pneumatic Controllers (any four points).

(c) Define and explain the terms : (i) Sensor (ii) Transducer.

(d) List components of Mechatronics System. Explain any two.

(e) Draw schematic diagram of LVDT accelerometer. Explain in brief.

(f) State type of bearing. Explain any one.

(g) Describe the concept of degree of freedom in robotic.

2. Attempt any FOUR : **16**

(a) Draw and explain the block diagram of fuzzy logic controller.

(b) Draw practical ABS system. List any four advantages of it.

(c) Draw block diagram of robotic system and explain in brief.

(d) State applications of mechatronics (any four).

(e) Draw block diagram of pneumatic control system. What is the role of filter in Pneumatic System ?

(f) List velocity sensors and explain any one with diagram.

3. Attempt any FOUR : **16**

(a) Draw block diagram of PLC based automatic car park barrier system and explain.

(b) Draw electronic PID controller with Op-Amp. Write its output expression.

(c) State the types of actuators. Draw and explain single acting cylinder.

(d) Explain Cartesian co-ordinate configuration with diagram.

(e) Draw block diagram of MEMs and explain.

(f) Draw block diagram of pick and place robot system. State role of each block.

4. Attempt any FOUR : **16**

(a) Explain working of CNC drilling machine with neat block diagram.

(b) State the principle of tachogenerator with the help of neat diagram.

(c) Draw PLC ladder diagram for following condition :

(i) The start push button can be pressed to start the conveyor motor.

(ii) Bottles moves and photosensor detect, conveyor motor stop automatically after a count of 25 bottles.

(d) List the types of gear and draw schematic of any one.

(e) Write four advantages and disadvantages of solenoid valve.

(f) Explain with an example the procedure to write a part program for drilling a hole.

5. Attempt any FOUR : **16**

(a) Explain Hall effect sensor with schematic diagram.

(b) Explain with diagram how torque is measured using strain gauge.

(c) Explain use of MEM accelerometer for airbag sensors car safety.

(d) Explain MEMs fabrication techniques.

(e) List advantages of PLC based car parking system (any four).

(f) Write the type of Car. Describe the working principle of any one type with diagram.

6. Attempt any FOUR : **16**

(a) Draw block diagram of fuzzy logic control in fully automatic washing machine.

(b) Draw architecture of micro-controller.

(c) Explain how stroboscope is used for measurement of speed of motor with suitable diagram.

(d) For a single conditioner explain the terms :

(i) Linearization

(ii) filters

(iii) isolation

(iv) signal conversion

(e) Draw construction of relay and explain its working.

(f) Explain operation of vane type Rotary Actuators with suitable diagram.
