17660

15116

3 Hours / 100 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.

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

Marks

1. Attempt any FIVE of the following : **20**

a) Define sensors, signal conditioners, controllers and actuators in mechatronics system.

b) Distinguish between a transducer and a sensor. (Any Four)

c) Give advantages, disadvantages of electronic controllers. (Two Each)

d) Explain implementation of proportional hydraulic controller.

e) Explain the basic components of pneumatic systems with neat sketch.

f) List any four applications of robot.

g) Give the block diagram of CNC based drilling machine.

Marks

2. Attempt any TWO of the following : **16**

a) Explain in detail photoelectric sensors and hall effect sensors.

b) Explain solenoid valve with neat diagram. Give its principle of operation, advantages, disadvantages and applications.

c) What is Robotics ? Draw the block diagram of robot and explain it.

3. Attempt any FOUR of the following : **16**

a) State advantages and disadvantages of mechatronics system. (Two Each)

b) Explain the principle of inductive and capacitive sensors. Give two applications of each.

c) Describe the PLC program scan sequence.

d) What is DC motor ? Give its working principle with neat diagram.

e) Define MEMS. List its application. (Any Two)

f) Explain the PLC based automatic car park barrier system.

4. Attempt any TWO of the following : **16**

a) Draw the block diagram of Fuzzy logic controller and explain the function of each block.

b) State the working principle of cam. List its types. Give any four applications of cam.

c) With neat block diagram explain microcontroller based antilock brake system.

Marks

5. Attempt any FOUR of the following : **16**

a) What is mechatronics ? Write its applications. (Any Two)

b) Draw and explain piezoelectric accelerometer.

c) Draw the ladder diagram for ON-OFF control of lamp.

d) Explain the types of gears.

e) Explain the construction of spherical robot in brief.

f) Explain PLC based Pick and Place robot.

6. Attempt any FOUR of the following : **16**

a) Explain LVDT accelerometer with neat diagram. Give its applications.

b) Explain torque measurement using stain gauge.

c) Give general configuration of CNC system. Give advantages of CNC. (Any Two)

d) What is actuator ? Explain the principle of linear actuator.

e) Classify the robots based on workspace.

f) Give the advantages and disadvantages of CNC based drilling machine. (Two Each)

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