Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AE) (Sem.–7)

AUTOMATION AND MECHATRONICS

Subject Code : BTAE/DE-713

M.Code : 71823

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a) Enumerate the applications of automation in the contemporary manufacturing scenario.

b) What do you understand by pressure regulating valve?

c) Enumerate the socio economic considerations of industrial automation.

d) What do you understand by end effector?

e) Explain the function of limit switch.

f) How do sensors work in robots?

g) What are the different types of PLC?

h) What is cylinder sequencing?

i) What do you understand by data acquisition?

j) How robots are classified based on path control?

SECTION-B

2. What is an actuator in hydraulic system? How does a hydraulic rotary actuator work?

3. What are the main components of a PLC? Explain the features of PLC and also explain the PLC block diagram.

4. Explain different types of sensors used in industrial robots.

5. What is mechatronics? Explain the basic elements of a mechatronic system.

6. Discuss various types of electrical actuation systems.

SECTION-C

7. a) Explain the applications of personal computers in various control and automation functions.

   b) What is a stepper motor used for? Explain the working principle of stepper motor giving the circuit of stepped motor.

8. a) What is difference between ADC and DAC? Why ADC and DAC are required in robots?

   b) Describe the general form of a basic closed-loop system. Explain the different elements of closed loop systems.

9. a) Explain the industrial applications of robots for assembly and spray painting operations.

   b) Explain the stages involved in the design process for any system. Further differentiate between Traditional and mechatronics designs.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.