



**Seventh Semester B.E. Degree Examination, June/July 2025**  
**Industrial Robotics**

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

**Module-1**

- 1 a. Define Robotics and Automation. Explain different types of automation. (10 Marks)
- b. Explain 3 H's of Robotics. (06 Marks)
- c. What is the contribution of science in the field of robotics? (04 Marks)

**OR**

- 2 a. Explain brief history of Robotics. (06 Marks)
- b. Explain what is current industrial robotics market distribution by 2020 and what are the future prospects. (07 Marks)
- c. With sketch, explain different components in robotics system. (07 Marks)

**Module-2**

- 3 a. What is Robot Anatomy and work volume? (06 Marks)
- b. Explain with neat sketch different physical configuration of robot. (14 Marks)

**OR**

- 4 a. Explain 3 types of precision of movement with respect to robot. (06 Marks)
- b. Explain gripper and end effectors. (06 Marks)
- c. Define sensor. Explain different sensors used in robots. (08 Marks)

**Module-3**

- 5 a. Explain with characteristics of proportional, integral and proportional – integral – derivative controller. (10 Marks)
- b. Briefly explain pneumatic and hydraulic actuators with its advantages and disadvantages. (10 Marks)

**OR**

- 6 a. Explain position and velocity sensors. (10 Marks)
- b. With neat sketch, explain construction and working principle of stepper motor. (10 Marks)

**Module-4**

- 7 a. Briefly explain tactile sensors, proximity sensors and range sensors. (09 Marks)
- b. Explain desirable properties of sensors. (06 Marks)
- c. What are the uses of sensors in robotic? (05 Marks)

**OR**

- 8 a. Explain in details sensing and digitizing in machine vision with typical technique used. (10 Marks)
- b. Briefly explain the techniques of image processing and analysis. (05 Marks)
- c. What are the robot application of machine vision? (05 Marks)

**Module-5**

- 9 a. What is robot programming? Explain in brief with characteristics and methods. (08 Marks)  
b. What is motion interpolation? What are the possibilities of it? (06 Marks)  
c. Explain branching in robot programming. (06 Marks)

**OR**

- 10 a. With an example, explain wait, signal and delay commands. (06 Marks)  
b. Explain head through programming and its types. (06 Marks)  
c. What are the three methods of defining position in space? Explain them with neat sketch. (08 Marks)

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