



CBCS SCHEME

18MT651

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Robotics and Automation

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What is Robotics? Explain articulated, polar configuration of robot with applications and joint scheme. (10 Marks)
b. Write a short note on dynamic stabilization of robots with a mathematical equation. (10 Marks)

OR

- 2 a. How robots developed over the period of time? And explain laws of robotics. (10 Marks)
b. Explain the following:
i) Degree of freedom
ii) Work volume of robot
iii) Industrial robot
iv) Resolution of robot
v) Repeatability. (10 Marks)

Module-2

- 3 a. With a neat sketch, explain any one type of sensors used in robot and also describe the applications. (10 Marks)
b. Compare the power drive systems in industrial robots and mention advantages and limitations. (10 Marks)

OR

- 4 a. With block diagram, explain machine vision system in robots. (10 Marks)
b. Explain the working of optical encoder with neat sketch and mention the applications. (10 Marks)

Module-3

- 5 a. Explain the concept of force control in robots manipulators. (10 Marks)
b. Discuss the design consideration and list the parameters in grippers selection. (10 Marks)

OR

- 6 a. List the types of grippers in industrial robots and explain magnetic grippers. (10 Marks)
b. Explain with neat sketch the components of pneumatic force control. (10 Marks)

Module-4

- 7 a. Discuss on different controllers used in industrial automation. (10 Marks)
b. List the safety strategies in industrial automation and explain
i) Work cell control
ii) Operator interface
iii) Safety monitoring. (10 Marks)

OR

- 8 a. List and explain devices in automation. (10 Marks)
- b. Describe the industrial automation and explain types of automations. (10 Marks)

Module-5

- 9 a. Discuss on various storage systems used in industrial automation. (10 Marks)
- b. Explain the type of material handling systems used in industrial automation. (10 Marks)

OR

- 10 a. Explain the principles of material handling. (10 Marks)
- b. Write a note on different types of Automatic Identification and Data Capture technologies (AIDC) in industrial automation. (10 Marks)
