

CBCS SCHEME

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18EI752

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022 Robotics and Industrial Automation

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the Polar and the Cylindrical physical configurations of the robot anatomies with neat sketch. (10 Marks)
b. What is a Robot Drive System? Explain the types of drive system used in Industrial Robots. (10 Marks)

OR

- 2 a. Classify and explain the Industrial robots according to their Control Systems. (10 Marks)
b. Compare the different automation concepts used in Robotics. (10 Marks)

Module-2

- 3 a. Explain how the Mechanical grippers can be used as an end effector in Industrial robot using neat sketch. (10 Marks)
b. Explain the factors that are required to be considered in gripper selection and design. (10 Marks)

OR

- 4 a. Explain the technologies available for designing Proximity and range Sensors. (10 Marks)
b. List and explain the desirable features of Sensors. (10 Marks)

Module-3

- 5 a. With a neat diagram, explain the operation of Machine Vision System. (10 Marks)
b. Discuss in detail about the Segmentation technique in Image Processing and Analysis. (10 Marks)

OR

- 6 a. List and explain the goals of AI research. (10 Marks)
b. Explain the Search technique in problem solving in reaching some specified goal in AI. (10 Marks)

Module-4

- 7 a. With a neat diagram, explain the following Robot Cell Layouts :
i) Robot Centered work Cell ii) Mobile Robot Cell. (10 Marks)
b. List and explain the functions performed by the Work Cell Controller. (10 Marks)

OR

- 8 a. Explain the considerations in the design of the Work Cell. (10 Marks)
b. List and explain the general considerations in Robot material handling Operations. (10 Marks)

Module-5

- 9 a. What is Spot Welding? Explain the benefits of Automation of Spot Welding using Robots. (10 Marks)
b. Discuss the features and capabilities the Industrial robots must possess to perform welding operation. (10 Marks)

OR

- 10 a. Explain with sketch the actions of Remote Centre Compliance (RCC) device in Assembly Operation. (10 Marks)
b. Classify and explain the sensors used in Mobile Robots. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.