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18MT651

Sixth Semester B.E. Degree Examination, June/July 2023
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.　With neat diagram explain common configuration of Industrial Robots.　(10 Marks)
　　b.　Explain Asimov's Laws of Robotics.　(06 Marks)
　　c.　Define the following :
　　　　i) Industrial Robot and Robotics　　　ii) Degrees of freedom　(04 Marks)

OR

2　a.　With neat diagram describe different types of joints used in Robots.　(10 Marks)
　　b.　Write a short note on various generations of Robots.　(10 Marks)

Module-2

3　a.　Explain the importance of hydraulic drive systems in Robots with their advantages and limitations.　(10 Marks)
　　b.　Describe different variable speed arrangements used in Robot.　(10 Marks)

OR

4　a.　Explain Robot vision system with block diagram.　(10 Marks)
　　b.　Describe i) Acoustic Proximity sensor　　ii) Tactile sensors　(10 Marks)

Module-3

5　a.　List out and explain considerations in robot gripper selection and design.　(10 Marks)
　　b.　Explain the construction and working of pneumatic manipulator.　(10 Marks)

OR

6　a.　Classify End Effectors used in Robots and write a short note on different types of grippers.　(10 Marks)
　　b.　Write a short note on manipulator dynamics and force control.　(10 Marks)

Module-4

7　a.　What are the basic elements of Industrial automation? Explain.　(10 Marks)
　　b.　Write a short note on different controllers used in Industrial Automation.　(10 Marks)

OR

8　a.　Define Industrial Automation and explain types of Automation.　(10 Marks)
　　b.　Explain safety in Robotic systems and illustrate the three levels of safety.　(10 Marks)

Module-5

9　a.　Explain different types of material handling system in Automation.　(10 Marks)
　　b.　Explain ten principles of material handling systems in Industrial Automation.　(10 Marks)

OR

10　a.　Explain various Automatic Identification and Data Capture (AIDC) techniques used in Industrial Automation.　(10 Marks)
　　b.　Write a short note on :
　　　　i) Robot Pick and place operation　　ii) Robot palletizing　(10 Marks)

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