CBCS SCHEME

USN | | | | | | | | | | |

15MA82

Eighth Semester B.E. Degree Examination, June/July 2019
Industrial Robotics

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Briefly explain automation and robotics. **(05 Marks)**
b. Give a brief history of robotics. **(05 Marks)**
c. List the advantages and disadvantages of robots in industries. **(06 Marks)**

OR

2 a. Explain the classification and structure of robotic system. **(08 Marks)**
b. Briefly explain the robot drive system. **(08 Marks)**

Module-2

3 a. Explain basic control system concepts to models. **(08 Marks)**
b. Explain transformation and spring mass system using a block diagram. **(08 Marks)**

OR

4 a. Explain the methods of programming in robotics. **(08 Marks)**
b. Briefly explain programming with graphics in robotics. **(08 Marks)**

Module-3

5 a. Briefly explain manipulator kinematics in robot motion analysis and control. **(08 Marks)**
b. Explain homogeneous transformation and robot kinematics in motion analysis. **(08 Marks)**

OR

6 a. Explain links, joints and their parameters in robot motion analysis. **(08 Marks)**
b. Explain geometrical approach to direct and inverse kinematics. **(08 Marks)**

Module-4

7 a. Enumerate the general considerations on trajectory planning. **(08 Marks)**
b. Explain 4-3-4 trajectory with example. **(08 Marks)**

OR

8 a. Explain Euler's formulation for robot arm dynamics. **(08 Marks)**
b. Briefly explain motion equation of robot manipulator. **(08 Marks)**

Module-5

9 a. List and explain external sensors in robotics. **(08 Marks)**
b. Explain the elements of computer vision in robotics. **(08 Marks)**

OR

10 a. Explain analog to digital convention in robot sensors. **(08 Marks)**
b. Explain image processing and analysis in robot sensors. **(08 Marks)**

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