CBCS SCHEME

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

18MR651

Sixth Semester B.E. Degree Examination, June/July 2023
Automation and 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. What is automation? Explain the basic elements of an automated system. **(10 Marks)**

b. With a neat figure, explain computer process control system. **(10 Marks)**

OR

2 a. Explain the hardware components for automation and process control. **(12 Marks)**

b. Enumerate the differences between discrete manufacturing and process manufacturing. **(08 Marks)**

Module-2

3 a. What is automated production line? Explain the benefits and application of automated production lines. **(12 Marks)**

b. State and explain the automatic identification methods. **(08 Marks)**

OR

4 a. Explain the different configurations of automated assembly system. **(10 Marks)**

b. Write short notes on:
(i) Barcode technology (ii) Past delivery system in an automated system **(10 Marks)**

Module-3

5 a. Sketch and explain any four Robot configurations. **(12 Marks)**

b. Define Degrees of Freedom. State Asimov's laws of robotics dynamic stabilization. **(08 Marks)**

OR

6 a. Explain briefly the sensor and the end effectors used in robots. **(10 Marks)**

b. What are different types of robots? List the industrial robot applications. **(10 Marks)**

Module-4

7 a. What is spatial transformation, position and orientation in robotics? Explain briefly. **(10 Marks)**

b. What is the difference between a Cartesian space and joint space? List the disadvantages of the joint space trajectory generation. **(10 Marks)**

OR

8 a. Explain translation, rotation and transformation in robotics. **(10 Marks)**

b. What is robot mapping? Explain the transformation of free vectors and computational aspects of robotics. **(10 Marks)**

Module-5

9 a. What is robot programming? Explain the four levels of robot programming. **(10 Marks)**

b. What is offline programming? List and explain the tasks for offline programming. **(10 Marks)**

OR

10 a. What are the requirements of robot programming language? List the problems pertaining to robot programming languages. **(10 Marks)**

b. Explain the various types of robot programming with example. **(10 Marks)**

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