

# CBCS SCHEME

USN

1AM20MT407

18MT71

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 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. Define Automation. Explain different types of Industrial Automation. (10 Marks)  
b. Describe history of Robotics. (10 Marks)
- OR**
- 2 a. Define a Robot. Classify Robots based on their configurations. (10 Marks)  
b. Write a short note on Applications of Robots in Industries. (10 Marks)
- Module-2**
- 3 a. Write a short note on different types of drive systems used in Robots. (10 Marks)  
b. Explain Robot Anatomy and different types of joints used in Industrial Robots. (10 Marks)
- OR**
- 4 a. With neat diagrams, explain common Robot work cell layouts. (10 Marks)  
b. List out and describe considerations in selection and design of Robot Grippers. (10 Marks)
- Module-3**
- 5 a. Derive the mathematical model and transfer function equation for spring mass damper system. (10 Marks)  
b. Explain different position sensors used in Robots. (10 Marks)
- OR**
- 6 a. Explain different functions of sensors in Robots. (10 Marks)  
b. Write a short note on different types of motors used in Robots. (10 Marks)
- Module-4**
- 7 a. With the help of block diagram, explain functions and steps involved in machine vision system. (10 Marks)  
b. With a case study, describe the application of machine vision system in Robotics. (10 Marks)
- OR**
- 8 a. What are proximity sensors? Explain the working of proximity sensors. (10 Marks)  
b. Classify Tactile sensors. With a neat figure, explain the working of Force Sensor. (10 Marks)
- Module-5**
- 9 a. Explain capabilities and limitations of lead through programming. (10 Marks)  
b. Write a short note on different generations of Robot Programming Languages. (10 Marks)
- OR**
- 10 a. Describe different methods used in robot programming. (10 Marks)  
b. Explain the following terms used in robot programming: (10 Marks)  
(i) Motion Interpolation  
(ii) Wait, signal and delay  
(iii) Branching

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(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.