

Code No.: ME611OE

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III-B.TECH-II-Semester End Examinations (Regular) - May- 2023
INDUSTRIAL ROBOTICS
(CSM)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) What are the future applications of Robot? [2M]
- b) Differentiate flexible automation and fixed automation. [2M]
- c) Define DH parameter. [2M]
- d) Discuss about joint coordinates. [2M]
- e) Discuss Lagrange Euler formulation. [2M]
- f) Explain the terminology involved in trajectory planning. [2M]
- g) What are the limitations of potentiometer? [2M]
- h) Write the applications of range sensors. [2M]
- i) What features are required for robot in spot welding? [2M]
- j) What are the software packages available for robot programming? [2M]

PART-B

(50 Marks)

2. Illustrate the architecture of industrial automation systems. [10M]
- OR**
3. Discuss about the components of robot with neat sketch. [10M]
4. What do you mean by forward kinematics and reverse kinematics? Explain. [10M]
- OR**
5. What is homogeneous transformation matrix? Explain four sub matrices. [10M]
6. Determine the manipulator Jacobian matrix and singularities for the 3-DOF articulated arm. [10M]
- OR**
7. What are the common types of motion that a robot manipulator can make in travelling from point to point. [10M]
8. Explain the working principle of pneumatic actuator. [10M]
- OR**
9. Explain in detail about any two types of position sensors with a neat sketch. [10M]
10. Discuss various considerations taken into account for material handling. [10M]
- OR**
11. What features are required for robot in spray painting? Explain. [10M]
