Code No.: ME611OE | **R20** | **H.T.No.** | | | **8** | **R** | | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–II–Semester End Examinations (Supply) - June- 2025
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)	Define automation.	[2M]
b)	List out the basic components in a robot.	[2M]
c)	Differentiate between Forward kinematics and reverse kinematics.	[2M]
d)	Write about homogeneous transformation.	[2M]
e)	List any two applications of straight line interpolation robotics.	[2M]
f)	What do you mean by Jacobian matrix?	[2M]
g)	List the advantages and disadvantages of pneumatic actuators.	[2M]
h)	Mention the limitations of potentiometer.	[2M]
i)	List the features required for robot in spray painting.	[2M]
j)	State the applications of robots in different fields.	[2M]

PART-B **(50 Marks)**

2. Discuss in detail the factors to be considered while selection and design of grippers. [10M]

OR

3. Write short notes on the following: [10M]
   i) Repeatability.
   ii) Degrees of Freedom.
   iii) Speed of response.

4. Explain about homogeneous transformations in robot kinematics. [10M]

OR

5. Derive forward & inverse kinematics equations of manipulator for a particular position. [10M]

6. Differentiate between Lagrange Euler and Newton Euler Formulation. [10M]

OR

7. Explain briefly about the following: [10M]
   i) Slew motion ii) joint interpolated motion iii) straight line motion.

8. Describe the various types of sensors used in industrial robots with necessary examples. [10M]

OR

9. Draw the neat sketch and explain the construction and working principle of Pneumatic actuators. [10M]

10. Discuss in detail the different applications of robot in manufacturing industries. [10M]

OR

11. Explain about Robot Programming Languages in detail. [10M]

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