

(DME 424 C)

B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Final Year)

MECHANICAL ENGINEERING

Paper - IV : Robotics

Time : 3 Hours

Maximum Marks : 75

Answer question No. 1 compulsory

(1 × 15 = 15)

Answer ONE question from each unit

(4 × 15 = 60)

1) Write a short note on the following :

- a) Fixed automation.
- b) Grippers.
- c) Resolvers.
- d) Force and torque sensors.
- e) Steps in Trajectory planning.

Unit - I

2) a) Define the following terms :

- i) Robotics
- ii) Robot
- iii) Industrial robot
- iv) Automation

b) Explain common types of arms of robot.

OR

3) a) What are the specifications of robots?

b) What is Automation? Explain types of Automations with an examples.

Unit - II

- 4) a) Explain the degrees of freedom of a manipulator.
b) Explain with the help of a line diagram of a robot connected to a system.

OR

- 5) What are the considerations in the selection & design of remote centered devices? Explain.

Unit - III

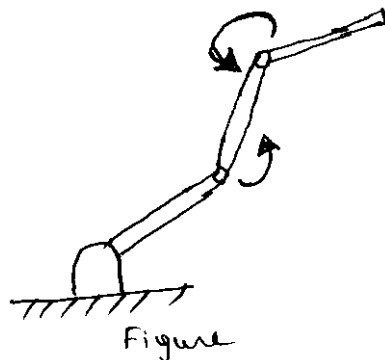
- 6) Explain the following in brief :
a) Position sensors.
b) Velocity sensors.

OR

- 7) Define Actuator. Explain briefly types of actuators used in Robots.

Unit - IV

- 8) Derive the forward kinematics equation using the D-H convention for the three link planar manipulator shown in figure.



OR

- 9) What do you mean by Jacobean? Derive the Jacobean matrix for a planar 2-link revolute jointed manipulator.

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