

Code: 13A03702

R13

B.Tech IV Year I Semester (R13) Regular Examinations November/December 2016

AUTOMATION & ROBOTICS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Draw the diagram of automation and control technologies in the production system.
 - (b) Elements of an automated system.
 - (c) Explain operation time and cycle time.
 - (d) What is poke-yoke?
 - (e) What is meant by pitch, yaw and roll?
 - (f) What are the four basic robot configurations available commercially?
 - (g) What is trajectory planning?
 - (h) Define degrees of freedom.
 - (i) What are the advantages of factory automation robots?
 - (j) Explain robot in spot welding.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Explain feedback control system.

OR

- 3 Explain about levels of automation.

UNIT – II

- 4 Explain the configurations of automated flow lines.

OR

- 5 Draw and explain the classification of assembly line balancing.

UNIT – III

- 6 Explain Pneumatic actuators system with neat sketch.

OR

- 7 Explain any two types of Gripper mechanisms.

UNIT – IV

- 8 With an example, differentiate forward and reverse kinematics.

OR

- 9 Explain the spatial Jacobian manipulator for a SCARA robot.

UNIT – V

- 10 Briefly explain the economic analysis of robots in detail.

OR

- 11 List out the types of robot programming methods. Explain any two.
