

Total No. of Questions : 5]

SEAT No. :

P2305

[Total No. of Pages : 2

[5254]-639

B.E. (Electrical)

ROBOTICS AND AUTOMATION

(2012 Pattern)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Solve Q1 or Q2.*
- 2) *Solve any two sub-questions from Q3 to Q5.*
- 3) *Neat diagram must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Your answers will be valued as a whole.*
- 6) *Use of logarithmic tables, slide rule, Mollier charter, electronic pocket calculator and steam tables is allowed.*
- 7) *Assume suitable data, if necessary.*

- Q1)** a) Write a short note on Robot intelligence based on robot programming. [7]
b) Explain with neat sketch about Robot anatomy. [7]
c) Explain degree of freedom with neat sketch. [6]

OR

- Q2)** a) Explain Yaw, pitch and roll. [7]
b) Explain Arm prosthesis Automation. [7]
c) Write in detail about Historical information of Robot science. [6]

P.T.O.

Q3) Solve any two

[16]

- a) Explain with neat sketch about Homogeneous coordinate.
- b) Explain co-ordinate reference frame.
- c) How many parameters are required for specifying position and orientation of rigid body? Explain.

Q4) Solve any two

[18]

- a) Explain Euler-Lagrange method to control robot motions and hence comment on Euler angle.
- b) Write short note on inverse kinematic problem using fixed frame rotation.
- c) How end effector rotary motion about an arbitrary axis can be achieved using dynamic control.

Q5) Solve any two

[16]

- a) Explain various linear control schemes.
- b) Explain resolved motion position control.
- c) Explain joint position control.