

Total No. of Questions : 8]

P7773

SEAT No. :

[Total No. of Pages : 2

[6180]-320

T.E. (Honors)

ROBOTICS

Principles of Robotics - I

(2019 Pattern) (Semester - I) (304181 HR)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.
- 2) Draw sketches wherever required.
- 3) Figures to the right indicate full marks.

- Q1)** a) What are the factors in selection and Design of Grippers. [6]
b) Explain with neat sketch magnetic Grippers. [6]
c) Explain with neat sketch vacuum grippers. [5]

OR

- Q2)** a) Explain various process tools as and effectors. [5]
b) What are Grippers? Explain their types and Application in various fields of Robotics. [6]
c) Explain with neat sketch Tactile sensor gripper. [6]

- Q3)** a) Explain with neat sketch capacitive sensor. [6]
b) Explain Machine Vision sensors in various Robotic Application. [6]
c) Explain with neat sketch LVDT sensor. [6]

OR

- Q4)** a) Explain with neat sketch force Torque sensor. [6]
b) Explain construction & working of piezo electric sensors. [6]
c) What is compliance used in Robotics. What is significance of compliance. [6]

P.T.O.

- Q5)** a) Explain with neat sketch steps in Trajectory planning. [6]
b) Enlist steps in Forward kinematic analysis. [5]
c) Write short note on Jacobian Transformation with one example. [6]

OR

- Q6)** a) A 200F planar R-R - manipulator has $L_1 = 120\text{mm}$, & $L_2 = 75\text{mm}$. Determine joint angles using geometric approach so that face end is located at (100,70). [6]
b) Compare illustrate & explain direct and inverse dynamics applicable to Robotics alongwith its applications. [5]
c) Explain with neat sketch - D-H parameter. [6]

- Q7)** a) Sketch and explain the Robotic vision systems. [6]
b) Explain various applications of Robots in (Any 3) [6]
i) Defence
ii) Sports
iii) Industry
iv) Hospitals
c) Explain Robot safety and also explain in Brief 5 groups at risk of direct injury from Robot. [6]

OR

- Q8)** a) Explain the Economic aspects in Robotics. [6]
b) Explain various Image preprocssing Techniques. [6]
c) What are Robot vision systems. Explain 3 levels of Robot vision system. [6]

