



JX-003-1277003

Seat No. _____

M. Sc. (ECI) (Sem. VII) Examination

October - 2019

Paper - 27 : Robotics

Faculty Code : 003

Subject Code : 1277003

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) All questions carry equal marks.
(2) Figures on right hand side indicate marks.
(3) Each question carries 14 marks.

1 Answer the following : (any seven) 14

- (1) What are the types of automations ?
- (2) What is robot programming ?
- (3) Write any one definition of robot.
- (4) What are links and joints ?
- (5) Write different uses/applications of the robot.
- (6) What is the difference between Dynamics and Kinematics ?
- (7) What is robot arm kinematics ?
- (8) What is the aim of direct kinematics ?
- (9) Write full form of "SCARA" robot.
- (10) What is norm of vectors ?

2 Answer the following : (any two) 14

- (1) Explain the Flexible Automation System (FMS).
- (2) Write on a robotic manipulator or robot arm.
- (3) Discuss robot anatomy.

- 3** Answer the following : **14**
- (1) Explain Euclidean Inner product in R^n .
 - (2) Explain total work envelope.

OR

- 3** Answer the following : **14**
- (1) Discuss briefly direct kinematics.
 - (2) Draw the block diagram of robot arm kinematics and very briefly write on it.

- 4** Answer the following : **14**
- (1) Explain load carrying capacity and speed.
 - (2) What is repeatability ?

- 5** Answer the following : (any **two**) **14**
- (1) Define the space and write on its different types.
 - (2) Mention the differences between orthogonality and orthonormality.
 - (3) How the robot is represented ?
 - (4) Discuss in detail the classification of robots.
