

BE SEM VIII (choice based) Summer 2022 [ECS]

Duration 3 Hours

Marks 80

121512e

Note:

1. Question number one is compulsory.
2. Solve any 3 out of the remaining five.
3. Figures to the right indicate full marks.

Q.1 Answer the following.

[20 M]

- a) What are moments in robotics ?
- b) Explain the meaning of "tool configuration vector (TCV)" and list its typical components.
- c) Classify Robot based on work envelope.
- d) State the difference between a path and a trajectory.
- e) Sketch and define kinematic parameters.

Q.2 a) Obtain ARM matrix for four axis SCARA robot using DH algorithm.

[10 M]

b) Explain Bug 2 algorithm.

[10 M]

Q.3 a) Explain interpolated motion using cubic polynomial paths.

[10 M]

b) Explain the Generalized Voronoi Diagram (GVD) in detail.

[10 M]

Q. 4 a) Describe edge detection techniques used in robotic vision systems.

[10 M]

b) Explain robot languages and its classification.

[10 M]

Q. 5 a) Develop Inverse Kinematic solution for 2 axis planar robot.

[10 M]

b) Explain interpolated motion using cubic polynomial paths.

[10 M]

Q. 6 Write a short note on Any two.

[20 M]

1. Gross motion planning
2. Template Matching
3. Perspective Transform
