

(FOR THE CANDIDATES ADMITTED

23UAI6E9

DURING THE ACADEMIC YEAR 2023

ONLY)

REG.NO. :

N.G.M. COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS: MAY 2026

BSC CS WITH AI & ML

MAXIMUM MARKS: 75

SEMESTER VI

TIME : 3 HOURS

PART-III

23UAI6E9– ROBOTICS & ITS APPLICATIONS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. The brain of a robot is the_____
a) Sensor b) Controller c) Actuator d) Manipulator
2. Which parameter represents the twist between links?
a) Link length b) Joint angle c) Link twist d) Offset\
3. A tachometer is used to measure_____
a) Speed b) Distance c) Force d) Voltage
4. Which type of gripper uses air pressure?
a) Hydraulic gripper b) Pneumatic gripper c) Magnetic gripper d) Vacuum gripper
5. End effectors are mounted on the_____
a) Base b) Wrist c) Joint d) Link

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

6. Define a robot manipulator.
7. What is meant by robot kinematics?
8. List any two types of robot joints.
9. Define a proximity sensor.
10. Define a robot vision system.

SECTION – B

(5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Explain the classification of robots based on configuration with examples.
(OR)
b) Describe the applications of robotics in industry.
12. a) Discuss different types of actuators used in robots.
(OR)
b) Explain D-H parameters with an example.

Ethical paper

(CONTD 2)

13. a) Illustrate the use of proximity sensors in robots.
(OR)
b) Describe vision sensors and their applications.
14. a) Explain the working of mechanical grippers.
(OR)
b) Discuss vacuum and magnetic grippers
15. a) Apply the concept of cell decomposition for robot navigation.
(OR)
b) Describe obstacle avoidance techniques.

SECTION – C**(5 X 8 = 40 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4 (Or) K5)**

16. a) Explain the basic components of a robot with a diagram.
(OR)
b) Evaluate the importance of Artificial Intelligence in robotics.
17. a) Explain robot kinematics and link transformations using D-H representation.
(OR)
b) Compare and evaluate stepper motor and servo motor for robotic applications.
18. a) Explain the drive systems for robotic grippers.
(OR)
b) Evaluate active and passive grippers for industrial usage.
19. a) Discuss the potential field method for obstacle avoidance with a case study.
(OR)
b) Evaluate different robot path planning techniques.
20. a) Explain the robot vision system and object recognition techniques.
(OR)
b) Discuss robot programming languages (VAL, RAPID) with examples.
