PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester V - 2021   **Date :** 2-NOV-2023
Course Code : MEC3099   **Time :** 9:30AM - 11:00AM
Course Name : Sem V - MEC3099 - Autonomous Mobile Robots   **Max Marks :** 50
Program : B. TECH   **Weightage :** 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS   **(5 X 2 = 10M)**

1. What are 3D sensors?

                                                                   (CO1) [Knowledge]

2. What are Contour sensors?

                                                                   (CO1) [Knowledge]

3. What are vision based sensors?

                                                                   (CO1) [Knowledge]

4. Define perception interms of robot.

                                                                   (CO2) [Knowledge]

5. Write a short note on In- Situ performance of sensors.

                                                                   (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS   **(4 X 5 = 20M)**

6. With suitable example explain Holonomic drive.

                                                                   (CO1) [Comprehension]

7. List and explain different types of wheeled locomotion.

                                                                   (CO2) [Comprehension]

8. List out different classification of robot.

                                                                   (CO1) [Comprehension]

9. Write a short note on **controllability and stability of robots.**

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION **(1 X 20 = 20M)**

10. **Forward kinematics is the process of determining the position and orientation of the end effector in Cartesian space with the help of the joint angles. With suitable diagram derive the equation for forward transformation of a 2 degree freedom arm.**

(CO1) [Application]