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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**Summer Term End Term Examinations, AUG- 2024**

**Semester**: III

**Course Code**: MEC 3060

**Course Name**: Robotics

**Program & Sem**: B. Tech& III Sem

**Date**: 05 Aug 2024

**Time**: 9.30 am to 12.30 pm

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*

**Part A [Memory Recall Questions]**

**Answer Four Questions. Each question carries 4.5 marks. (4Qx4.5M=18M)**

1. Define robot locomotion and explain about it in detail. (CO1, Knowledge Level)
2. Explain about different types of gears used in robots. (CO3, Knowledge Level)
3. Explain about path control mode of robot. (CO2, Knowledge Level)
4. Explain the types of actuators in detail. (CO2, Knowledge Level)
5. Explain about robot kinematics in detail. (CO4, Knowledge Level)

**Part B [Thought Provoking Questions]**

**Answer Three Questions. Each question carries 12 marks. (3Qx12M=36M)**

1. What is robot and explain about the anotomy of robot and write the applications of robots in several sectors. (CO1, Comprehension Level)
2. Explain about 3-wheel chassis and 4 wheel chassis robots in detail.

(CO2, Comprehension Level)

1. Explain the trajectory planning of robots. (CO3, Comprehension Level)
2. Write in detail about the play-back programming involved in robots.

(CO4, Comprehension Level)

**Part C [Problem Solving Questions]**

**Answer Three Questions. Each question carries 15.33 marks. (3Qx15.33M=46M)**

1. Explain in detail about the different types of end effectors used in robots with some examples. (CO1, Application Level)
2. Explain about the offline programming of Robot and explain the benefits of offline programming. (CO4, Application Level)
3. The second joint of SCARA manipulator is required to move from θ2= 300 to 1500 in 5 seconds. Find the cubic polynomial to generate the smooth trajectory for the joint. Assume that the initial and final velocity of the joint is Zero. (CO3, Application Level)
4. Write about the Robot programming functions and signal in detail with an example. Also write the advantages of it. (CO4, Application Level)