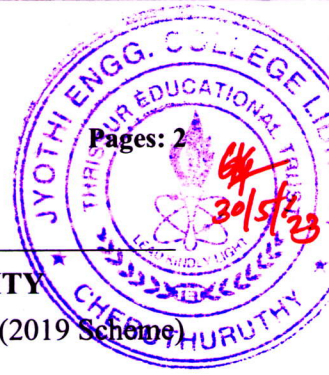Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Supplementary Examination May 2023 (2019 Scheme)

Course Code: MRT302
Course Name: ROBOTICS & AUTOMATION

Max. Marks: 100   **Duration: 3 Hours**

PART A
Answer all questions, each carries 3 marks.

Marks

1	Define roll, pitch and yaw.	(3)
2	Differentiate between a serial and parallel robot	(3)
3	Describe the working, applications and advantages of potentiometer sensors.	(3)
4	Write a short note on tactile array sensors.	(3)
5	When will hydraulic drive be preferred in robot?	(3)
6	Write a short note on translational operators.	(3)
7	What are the various advantages of PLC?	(3)
8	Define scan cycle.	(3)
9	Why we use interlocks? Explain with an example.	(3)
10	With suitable example explain latching in PLC Ladder logic.	(3)

PART B
Answer any one full question from each module, each carries 14 marks.

Module I

11 a) Explain the working principle of stepper motor with neat sketch.   (14)

OR

12 a) Draw and explain the components and structure of robotic arm?   (8)

   b) Sketch Following robot configuration.   (6)

      a) LVR

      b) RLR

      c) TRT: R

Module II

13 a) How encoders can be classified? Write about the operation of any two encoders.   (14)

OR

14 a) Name the device which is attached to the wrist of robot arm? How they can be classified? (8)

    b) List out the types of non-contact sensors. (6)
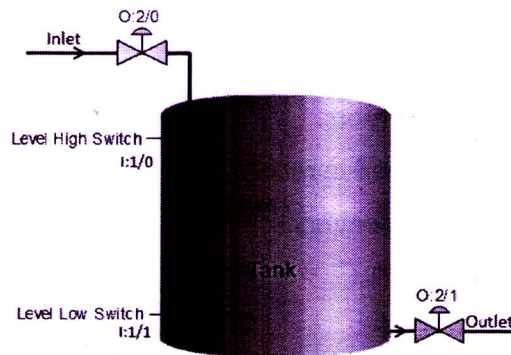
Module III

15 a) Differentiate forward and inverse kinematics (6)

    b) What is the purpose of transformation equation in robotics? Explain with neat sketches. (8)

OR

16 a) Explain D-H representation of a RRR robot (14)

Module IV

17 a) Write a PLC Program to Control Level of a Single Tank (14)

OR

18 a) Illustrate architecture of a PLC (8)

    b) What are the different types of PLC (6)

Module V

19 a) Explain the requirement of communication system in a PLC. (6)

    b) Illustrate the difference between up counter and down counter in PLC (8)

OR

20 a) What is the scope of industrial automation? (4)

    b) Write a PLC program to differentiate various comparison and manipulation instructions. (10)

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