IARE

IARE
INSTITUTE OF AERONAUTICAL ENGINEERING
(An Autonomous Institute affiliated to JNTUH, Hyderabad)
Dundigal, Hyderabad - 500 043

LABORATORY WORK SHEET

Name of the Student : Peddinti Kusuma

Class : CSE - C Semester : II

Roll Number										
2	3	9	5	1	A	0	5	4	5

Course Code : AMED02 Course Name : MP Lab

Name of the Course Faculty : Dr. Paidi Raghavulu Faculty ID : IARE 10631

Exercise Number : 11 Week Number : 11 Date : 28/06/24

DAY TO DAY EVALUATION:

Marks	Aim / Preparation	Algorithm / Procedure / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva - Voce	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	3	3	3	4	17

Signature of Faculty

START WRITING FROM HERE :

DEMONSTRATION OF SIX AXIS ARTICULATED ROBOT FOR PICK AND PLACE

Aim : Study on demonstration of six axis articulated robot for pick and place placing of load.

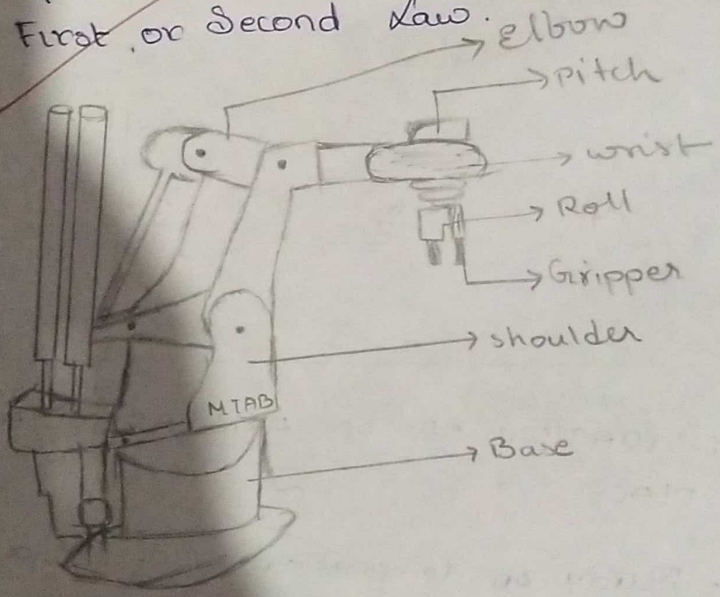
Introduction ;

Six axis articulated robotic arm ARISTO, as the name suggests, has six axis. Each axis is a joint that allows the robot to move in a different way (rotate, twist, etc). These different movements are referred to as degrees of freedom. A robot is a type of automated machine that can execute specific tasks with little or no human intervention and with speed and precision. They used advanced vision systems to identify, grasp and move objects from one place to another. With a variety of design option available, pick and place

robots can be configured with various end of arm tooling options for use in different applications, such as assembly, packaging or bin.

Principle of Pick and place robot:

1. Robot should not injure a human being or through inaction, allow a human to be harmed. ~~to be~~
2) A robot must obey orders given by humans except when that conflicts with the First Law.
3) A robot must protect its own existence unless that conflicts with First or Second Law.



Components of six axis robotic arm:

Six axis industrial robots generally have 6 degrees of freedom, including

→ rotation (S axis)
→ lower arm (L axis)
→ Upper arm (U axis)
→ wrist rotation (R axis)
→ wrist swing (B axis)
→ and wrist rotation (T axis); the combination of 6 joints realizes the 6 degree of freedom movement of

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the end, which has many fan advantages.

→ Robot arm tool: A robotic arm, also known as a manipulator is the extension of the robot by using cylindrical or spherical parts, links, and joints.

→ End Effector: The end effector is the accessory at the end of the robotic arm, that does the required job such as gripping objects. The end effectors can be designed to perform different functionalities based on requirements.

→ Actuators: Actuators create the motion in the robotic arm and end effectors. The linear actuators are basically any type of motor, such as servor motor, stepper motor, or hydraulic cylinder.

→ Sensors: Sensors as the eyes of the robots. The sensors do the tasks like identifying the positions of the object. Sensors passes signals to a controller to enable appropriate behavior.

→ Controllers: Controllers synchronize and control the movement of different actuators of a robot, thereby being the brain behind the smooth robotic operation.

How to choose the right pick and place robot
i) Number of Axes ii) Reach: iii) Repeatability iv) Speed
v) Configuration and vision (vi) payload.

Working of pick and place robot.

→ Robotic arm is mounted on a stable stand, pick and place robots are positioned to reach different area to perform work

→ They use advanced vision systems to identify, grasp and move objects from one place to another.

→ With a variety of design options available, pick and place robots can be configured with various end of arm tooling options for use in different applications.

→ The six axis motion robot mechanical structure is as shown in diagram. Six servo motors directly drive the rotation of 6 joint shafts through a reducer and a synchronous pulley.

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Six axis industrial robots generally have 6 degrees of freedom. Common six axis industrial robots include rotation (S-axis), lower arm (L-axis), upper arm (U-axis), wrist rotation (R-axis) and wrist swing (B-axis). And wrist rotation (T-axis). Six motions are combined to achieve a 6 degree of freedom action.

Applications of pick and place robots.

1) Assembly
2) Packaging
3) Bin picking
4) Inspection.

5/7/24