

SATHYABAMA



INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with Grade "A ++" by NAAC

(A Christian Minority Institution)

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119.



Name of the Student : A. ARTHIKA

Register Number : 41612006

Subject code : SMRA2602

Subject Name : ROBOT PROGRAMMING LAB

Certified that the work submitted here in, is the bonafide work of the above mentioned student, carried out in ROBOT PROGRAMMING. Laboratory

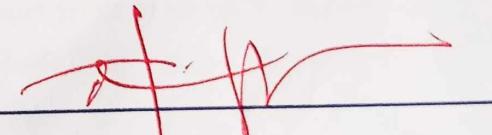
from JAN 2024 to MAY 2024
(Month) (Month)


Signature of the Lab in Charge

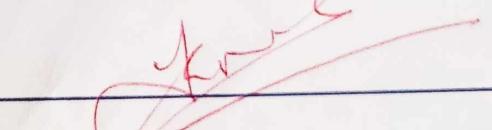
Examiners:

Date: 03/05/2024

Internal



External



Name of the Laboratory

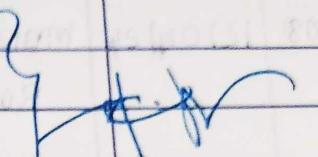
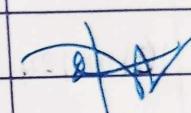
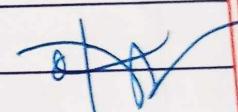
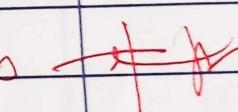
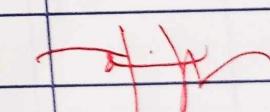
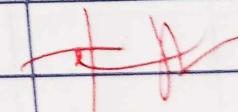
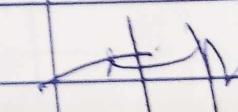
: ROBOT PROGRAMMING IN LAB

Sub. Code

: SMRA260R

Name of the Staff In-Charge

: Dr. J. Jeya Jeevahan S.D.I.

Sl No.	Date of Experiment	Name of the Experiment	Page No.	Date of Submission	Marks	Staff Signature with Date
	08/03/24	SAFETY MEASURES STUDY	01-03	05/04/24	?	
		MITSUBISHI RV-8CRL ROBOT	05-09			
		MELFA BASIC COMMANDS	11-15			
01.	18/03/24	FINANCIAL CONTROL OF ROBOT USING SCOUT MODE	15-17	05/04/24	10	
02.	18/03/24	ROBOT PROGRAMMING WITH JOINT MOTION	19-21	05/04/24	10	
03.	22/03/24	ROBOT PROGRAMMING WITH LINEAR MOTION	23-25	05/04/24	10	
04.	22/03/24	ROBOT PROGRAMMING WITH CIRCULAR MOTION.	27-29	05/04/24	10	
05.	05/04/24	PICK AND PLACE THE ROBOT	31-33	08/04/24	10	
06.	05/04/24	ROBOT PROGRAMMING WITH CONTINUES MOTION	35-37	08/04/24	10	
07.	12/04/24	LETTER TRACING USING ROBOT PROGRAM.	39-41	(21/04/24)	10	

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Name of the Laboratory

Sub. Code

Name of the Staff In-Charge

LEARNING OBJECTIVE :-

* To understand and Safety Protocols and handling measures specific to the RV-8CRL-D Robot.

ROBOT SPECIFICATIONS :-

MODEL : RV-8CRL-D-S15

MAKE : MITSUBISHI

PAYLOAD CAPACITY : 8 kg

MAXIMUM REACH : 1.5 M

NUMBER OF AXIS : 6

SAFETY AND HANDLING MEASURES :-

Safety is paramount when working with industrial robots like the RV-8CRL-D-S15. Before engaging in any programming or operation activities, it is essential to familiarize yourself with the following safety and handling measures.

1. SAFETY TRAINING :-

All lab participants must undergo thorough safety training before interacting with the RV-8CRL-D-S15 robot. Training should cover emergency procedures, proper use of safety equipment, and guidelines of safe robot handling.

2. SAFETY FEATURES :-

The RV-8CRL-D-S15 is equipped with built-in safety features, including collision detection, torque sensors, and safety features including emergency stop buttons. Familiarize yourself with these features and understand how to use them effectively in case of emergencies.

3. WORKSPACE PREPARATION:-

Ensure that the robot's workspace is clear of obstacles and hazards before starting any programming or operation tasks. Keep cables, tools and other equipment organized to prevent interference with robot movements.

4. PERSONAL PROTECTIVE EQUIPMENT (PPE):-

Wear appropriate safety glasses, gloves and protective clothing, when working with the RV-8CRL-D-S15 Robot. PPE helps minimize the risk of injury from accidental contact or exposure to hazardous materials.

5. HANDLING PROCEDURES:-

Follow proper handling procedures when interacting with the RV-8CRL-D-S15 Robot, including loading and unloading workpieces, adjusting tooling, and performing routine maintenance tasks. AVOID REACHING INTO THE ROBOT'S OPERATION.

LEARNING OBJECTIVE :-

To study the Specifications, and different parts and their functions of the Mitsubishi RV-8CRL robot.

MITSUBISHI RV-8CRL ROBOT :-

Mitsubishi RV-8CRL robot is a vertical type of industrial robot manufactured by Mitsubishi Electric Corporation. In RV-8CRL robot, RV indicates the vertical multi-joint robot; 8 indicates the maximum load (8 kg);

The Mitsubishi MELFA RV-8CRL Industrial Robot is a slim and compact robot designed for utility and functionality. RV-8CRL robot utilizes CR500, CR700 and CR800 Series controllers. The controller acts as a brain that controls all the components of the robot. A teach pendant is connected to the controller through the teach mode and manual mode can be performed.

RT - Toolbox 3 is the primary software package for Mitsubishi Electric robots. This software includes a comprehensive set of tools for all major robot programming and configuration tasks.

MELFA-BASIC is the programming language used to enable users to create programs in minutes. Different MELFA BASIC versions are available like IV, V and VI (varies depending on the model). RV indicates the vertical multi-joint robot; 8 indicates the maximum load (8 kg); CR indicates the CR (Compact Robot) series; and L indicates the long arm type (250 mm).

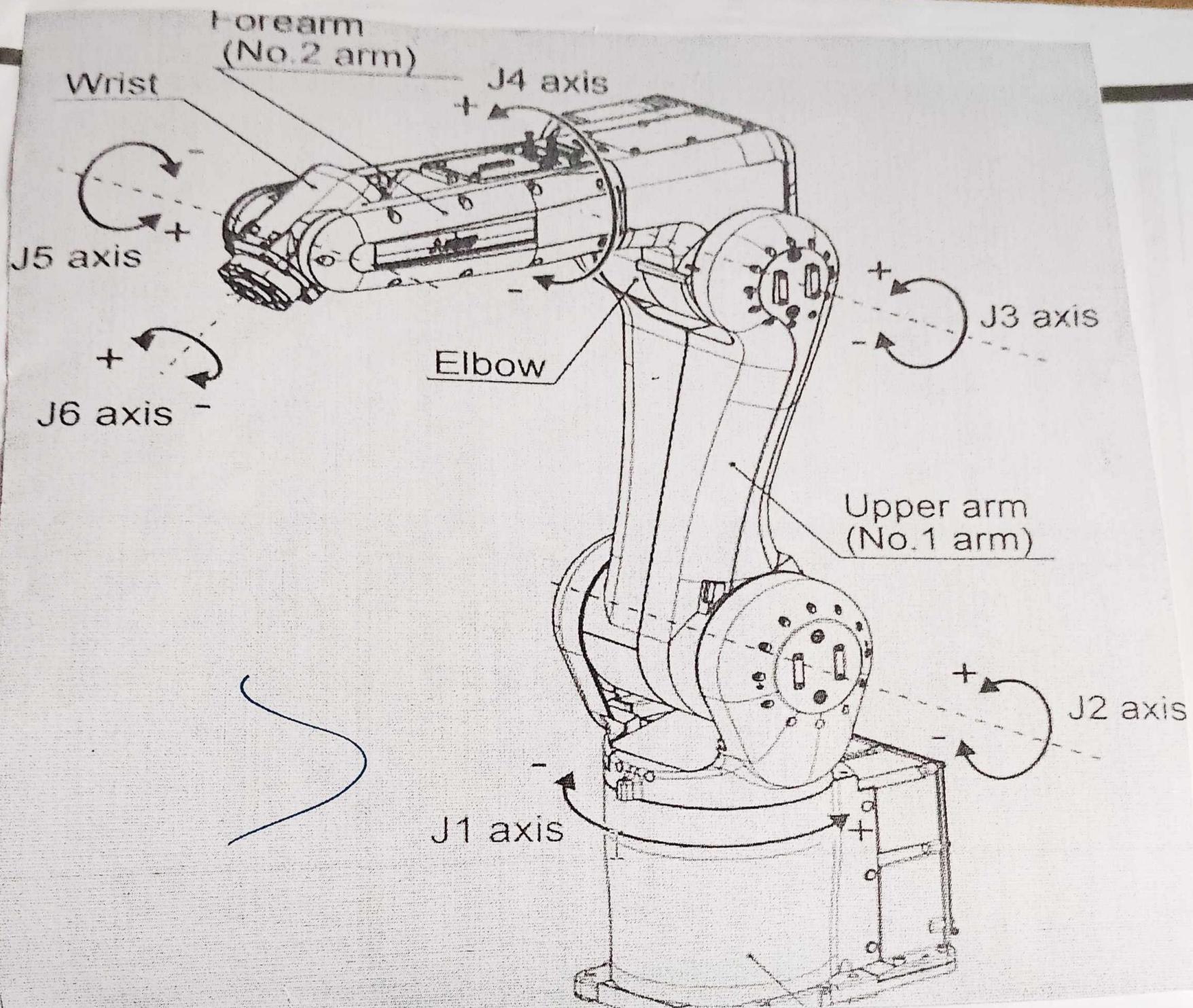
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Date : _____

PARAMETER	UNIT	SPECIFICATION
Controller		CR800-D
protection level		IP65
Installation position		on floor, suspended (wall mounted)
Number of Axes Controlled		6
Drive system		AC SERVOMOTOR
position detection system		Absolute Encoder
path control method		PTP Control, CP Control.
Robot language		MELFA - BASIC V, VI
position teaching modes		Teach pendant, MDI
Load Capacity	Rated Kg	7
	maximum Kg	8
Operating Range	J1 0	± 170
	J2 0	± 110
	J3 0	+ 0 to + 165
	J4 0	± 200
	J5 0	± 120
	J6 0	± 360
Maximum Speed	J1 % S	288
	J2 % S	321
	J3 % S	360
	J4 % S	337
	J5 % S	450
	J6 % S	720
positional repeat accuracy	mm	± 0.02
Mass	kg	41
Dimension	mm	280 × 1020 × 865.



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RESULT :-

The Configuration, Specifications, and different parts and their functions of the Mitsubishi RV-8CRL Robot were successfully studied.

LEARNING OBJECTIVE :-

To Learn the Important MELFA BASIC Commands.

MELFA BASIC :-

MELFA-BASIC is a programming language development by Mitsubishi Electric for controlling Industrial Robots. A MELFA-BASIC file is a program to control the robot's end effector, sometimes called the gripper, to predefined target positions (Teach points). RT Toolbox is the programming environment that allows program creation, simulation, and controlling of Mitsubishi electric robots.

Description / Function	Command
Robot Operation Control	
Joint Interpolation movement	MOV
Linear Interpolation movement	MVS
Circular Interpolation movement	MVR, MVR2, MVR3, MVC
Continuous movement	CNT
Hand and tool Control	HOPEN, HCLOSE, TOOL
Pallet operation	DEF PLT, PLT
Program Control	
Unconditional branching	GOTO
Conditional branching	IF THEN ELSE
WAIT	WAIT
REPETITION	FOR NEXT, WHILE WEND

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Subroutine
delay
stopping

GOSUB, CALLP
DLY
HLT, END

Input & Output Signals
Input Signals
Output Signals

M_IN
M_OUT

Communication

OPEN, CLOSE, PRINT, INPUT

Expressions and Operations

Numerical Operators
Comparison Operators
Boolean Operators

+, -, *, /, ^
=, <>, ><, <, >, <=, >=
AND, OR, NOT, XOR.

RESULT:-

The important MELFA-BASIC Commands were
successfully learnt.

LEARNING OBJECTIVE:

- * To move the Mitsubishi RV-8CRL Robot to the desired positions using jog mode.

PROCEDURE:

- * Launch RT Toolbox 3.
- * Setup the program file "click on new icon".
- * Open control panel click on "show/hide op" in online tab.
- * Click on "Jog mode". This opens up the joints coordinates.
- * By clicking on either + or - symbols, the respective joints can be moved to the desired angles.
- * By using the combinations of different joint coordinates, one can move the robotic arm to the desired positions.

1. RCL ROBOT CONTROLLER

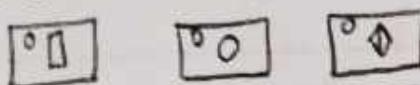
Status: Program selection possible
 Program: nov 1
 Line #: 0001 Select →
 Jump ↵

Override



Operation Panel

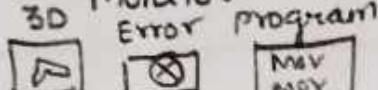
SVOON SVOFF START



STOP RESET END

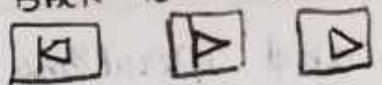


Monitor



Step

FORWARD CONT



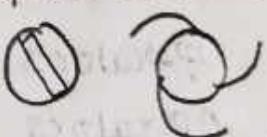
D-EXEC HAN D



Driving Speed Automatic

Normal

10 W



Hand



1. RV - SCRRL - D ▼

Joint ▼ Off ▼

TOOL ▼ Base ▼ Work ▼

J₁

[6 000]

- +

J₂

[0 . 000]

- +

J₃

[90 . 00]

- +

J₄

[0 . 000]

- +

J₅

[0 . 000]

- +

J₆

[0 . 000]

- +

RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	ARTHIKA A
Dept.	CSE AI & ROBOTICS A1	Year/Sem	II nd year / VI Sem
Exp. Name	MANUAL CONTROL OF ROBOT USING JOINT MODE		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)		08/ 03/ 24	Marks Secured (Out of 10)		
Date of Experiment (Actual)		08/ 03/ 24			
Date of Submission of Observation Note Book		15/ 03/ 24			
Date of Submission of Record Note Book		18/ 03/ 24			

Signature of the Lab Handling Faculty

~~KPN~~

RESULT:-

The Mitsubishi RV-CR8L robot was successfully moved to the desired positions using job mode.

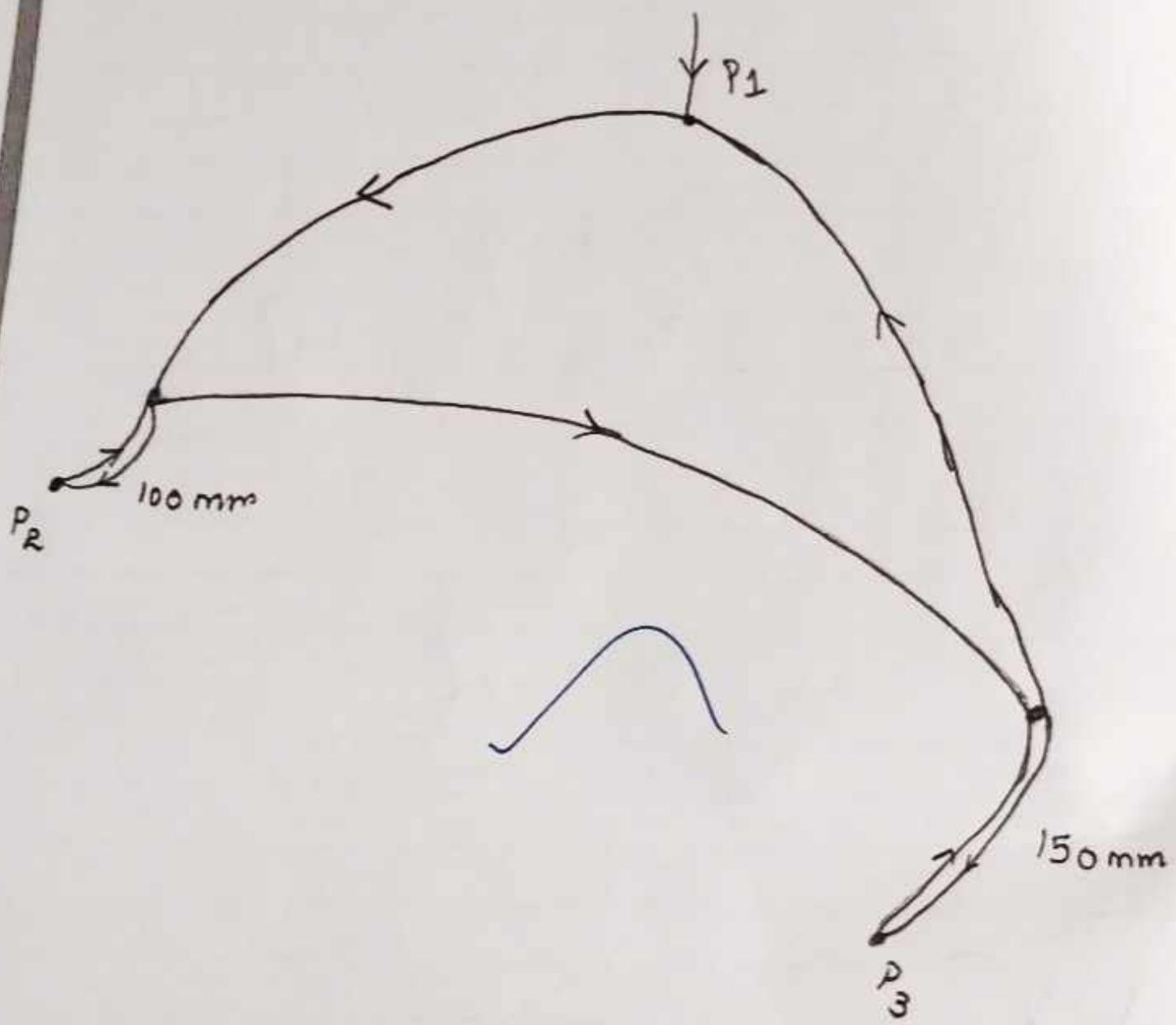
LEARNING OBJECTIVE :-

To write and execute a robot program to move the robot using joint motion.

PROCEDURE :-

- * Launch RT toolbox 3
- * Create a new file, set up the Mitsubishi RV - CR8L robot followed by the instructions.
- * Set up the program file and finish selecting the robot and language. Go to online right click the program and create a new language.
- * Add 3 points P₁, P₂, P₃, Modes are move to the robot different positions and Store the current positions of the robots in respective value box.
- * Add the program on the program files, Run the program and See the robot is moving accordingly as per your instructions.
- * Finally, the robot reached the position, to move accordingly to linear motion.

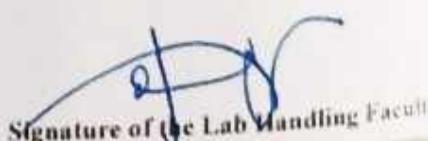
JOINT MOTION



RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	4161R006	Name	ARTHIKA · A
Dept.	B.E-CSE AI & ROBOTICS	Year/Sem	II nd year / VI Sem
Exp. Name	ROBOT PROGRAMMING WITH JOINT MOTION.		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)	08/03/24			Marks Secured (Out of 10)	10
Date of Experiment (Actual)	08/03/24				
Date of Submission of Observation Note Book	15/03/24				
Date of Submission of Record Note Book	18/03/24				


 Signature of the Lab Handling Faculty

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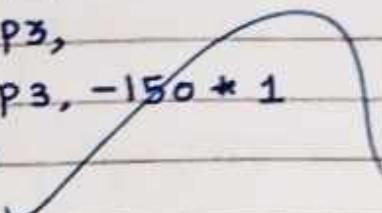
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Date: _____

PROGRAM CODE :-

MOV P1
MOV P2, -100 * 1
MOV P2
MOV P2, -100 * 1
MOV P3, -150 * 1
MOV P3,
MOV P3, -150 * 1
END



RESULT :-

In this experiment, A robot program was return and executed successfully to move the robot using joint motion.

LEARNING OBJECTIVE:-

To write and execute a robot program to move the robot using linear motion.

PROCEDURE:-

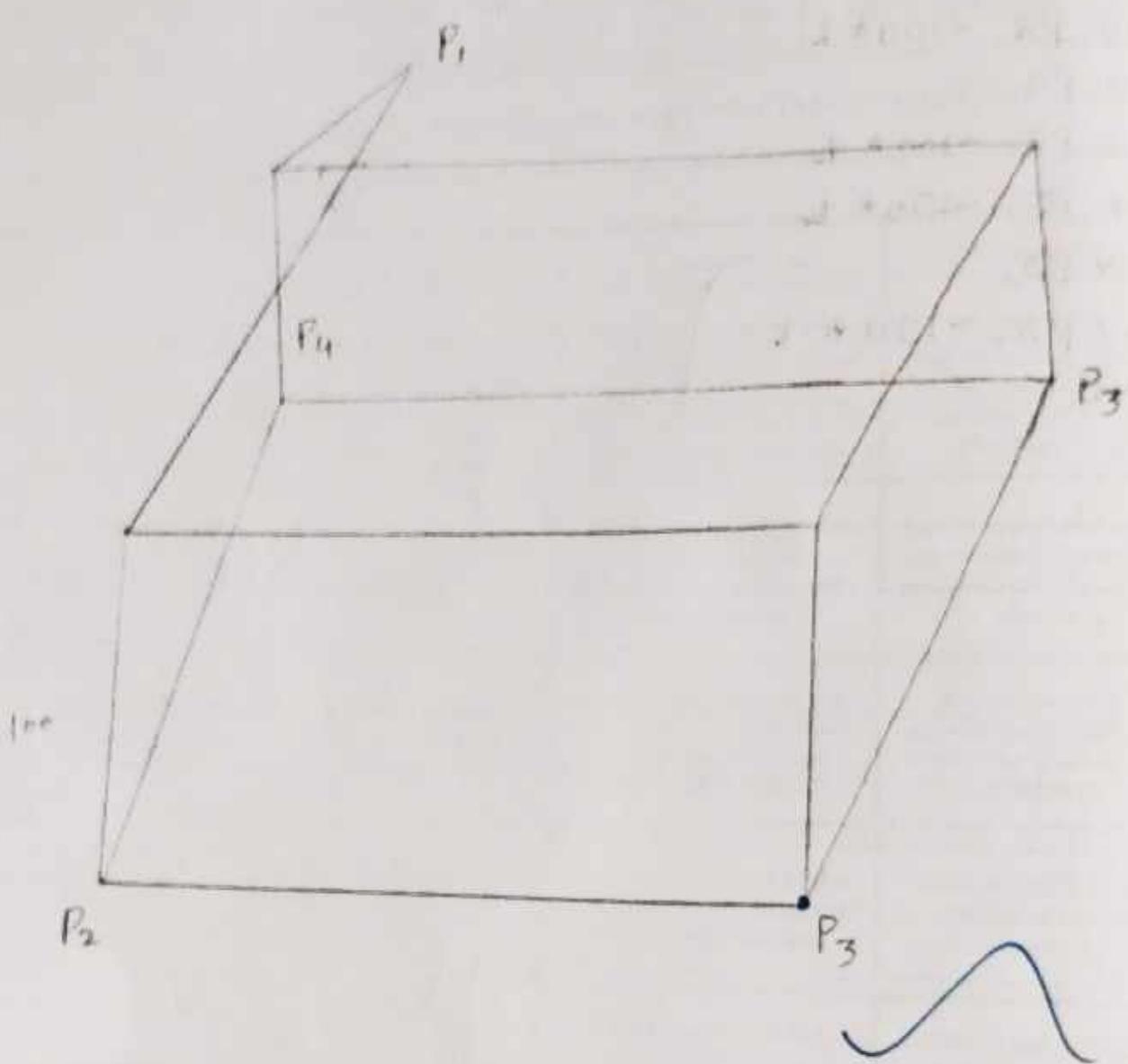
- * Launch RT toolbox 3, Create a new file, set up the program file and finish setting and Selected the Robot.
- * Go to online right click the program and Create a new program.
- * Add 4 points P₁, P₂, P₃, P₄ Modes are move to the robot in different positions and Store the current positions of the robots in respective values box.
- * Add the program on the Program files, Run the program and See the robot's is moving accordingly, as per your instructions.

PROGRAM CODE:-

```

MVS P1
MVS P2, -100*1
MVS P2
MVS P2, -100*1
MVS P3, -100*1
MVS P3,
MVS P3, -100*1
MVS P4, -100*1
MVS P4,
MVS P4, -100*1
MVS P1
END

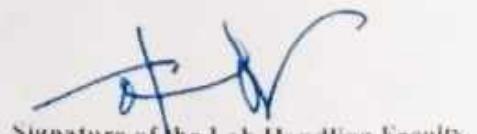
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RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	A. ARTHIKA.
Dept.	B.E.CSE AI 4 ROBOTICS	Year/Sem	III rd year VI Sem.
Exp. Name	ROBOT PROGRAMMING WITH LINEAR MOTION		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score		
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2		
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2		
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2		
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2		
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2		
Date of Experiment (Scheduled)	15/03/24			Marks Secured (Out of 10) 10			
Date of Experiment (Actual)	15/03/24						
Date of Submission of Observation Note Book	22/03/24						
Date of Submission of Record Note Book	22/03/24						



Signature of the student / Teacher / Advisor

RESULT:-

In this experiment, a robot program was written and executed successfully to move the robot using linear motion.

LEARNING OBJECTIVE :-

TO WRITE AND EXECUTE A ROBOT PROGRAM TO MOVE THE ROBOT USING CIRCULAR MOTION.

PROCEDURE :-

- * To Launch RT toolbox 3, Create a new file, Set up the program file.
- * Go to online right click the program and create a new program.
- * Add 5 points P1, P2, P3, P4, P5 moves the robot to the different positions and stored the current positions of the robots in the respective values box.
- * Add the program on the program files, Run the program and see the robot's in moving accordingly, as per your instructions.

PROGRAM CODE :-

MVR : P1 P2 P3

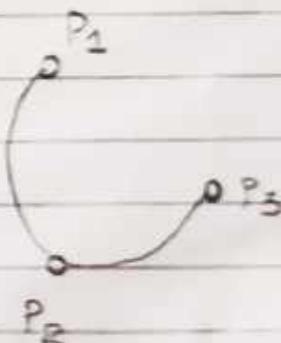
MOV P1, -50 * 1

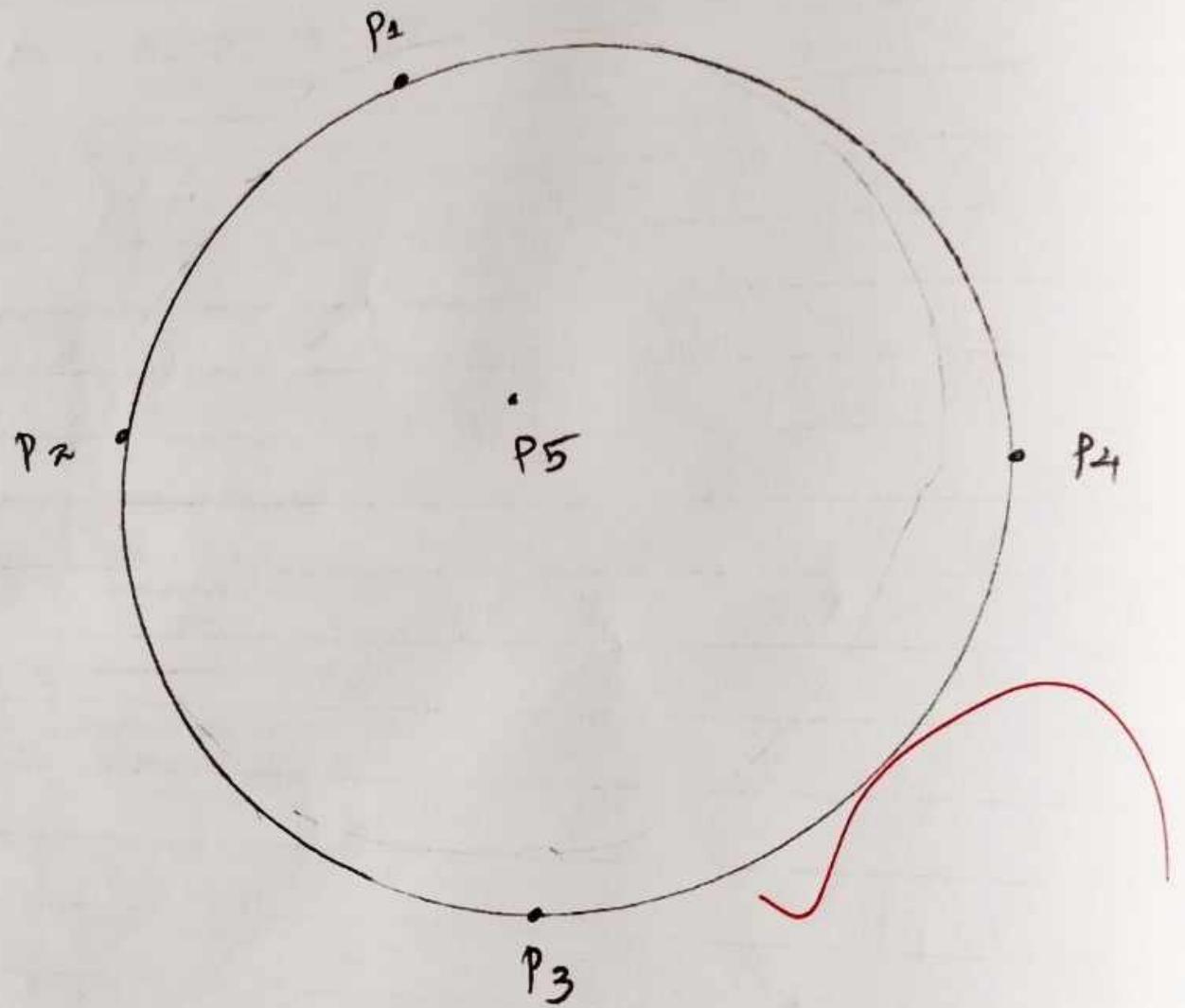
MVS P1

MVR P1, P2, P3

MVS P3, -50 * 1

END

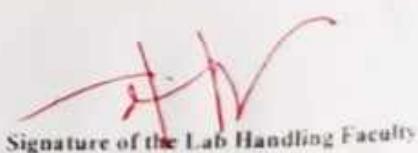




RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	ARTHIKA · A
Dept.	CSE AI & ROBOTICS	Year/Sem	II rd year I V th Sem
Exp. Name	ROBOT PROGRAMMING WITH CIRCULAR MOTION		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	3
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)		22/03/24	Marks Secured (Out of 10)		
Date of Experiment (Actual)		22/03/24			
Date of Submission of Observation Note Book		05/04/24			
Date of Submission of Record Note Book		08/04/24			


 Signature of the Lab Handling Faculty

MVR 2 :- P₁ P₂ P₄

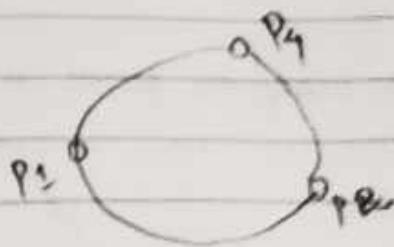
Mov P₁, -50 * 1

MVS P₁

MVR 2 P₁, P₂, P₄

MVS P₄, -50 * 1

END



MVR 3 :- P₁ P₃ P₅

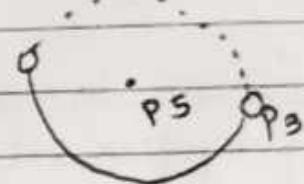
Mov P₁, -50 * 1

MVS P₁

MVR 3 P₁, P₃, P₅

MVS P₅, -50 * 1

END



~~MVC :- P₁ P₃ P₄~~

~~Mov P₁, -50 * 1~~

~~MVS P₁~~

~~MVC P₁, P₃, P₄, P₁~~

~~MVS P₁, -50 * 1~~

~~END~~

~~XV~~

RESULT :-

In this Experiment, a Robot program was written and executed successfully to move the robot using circular motion.

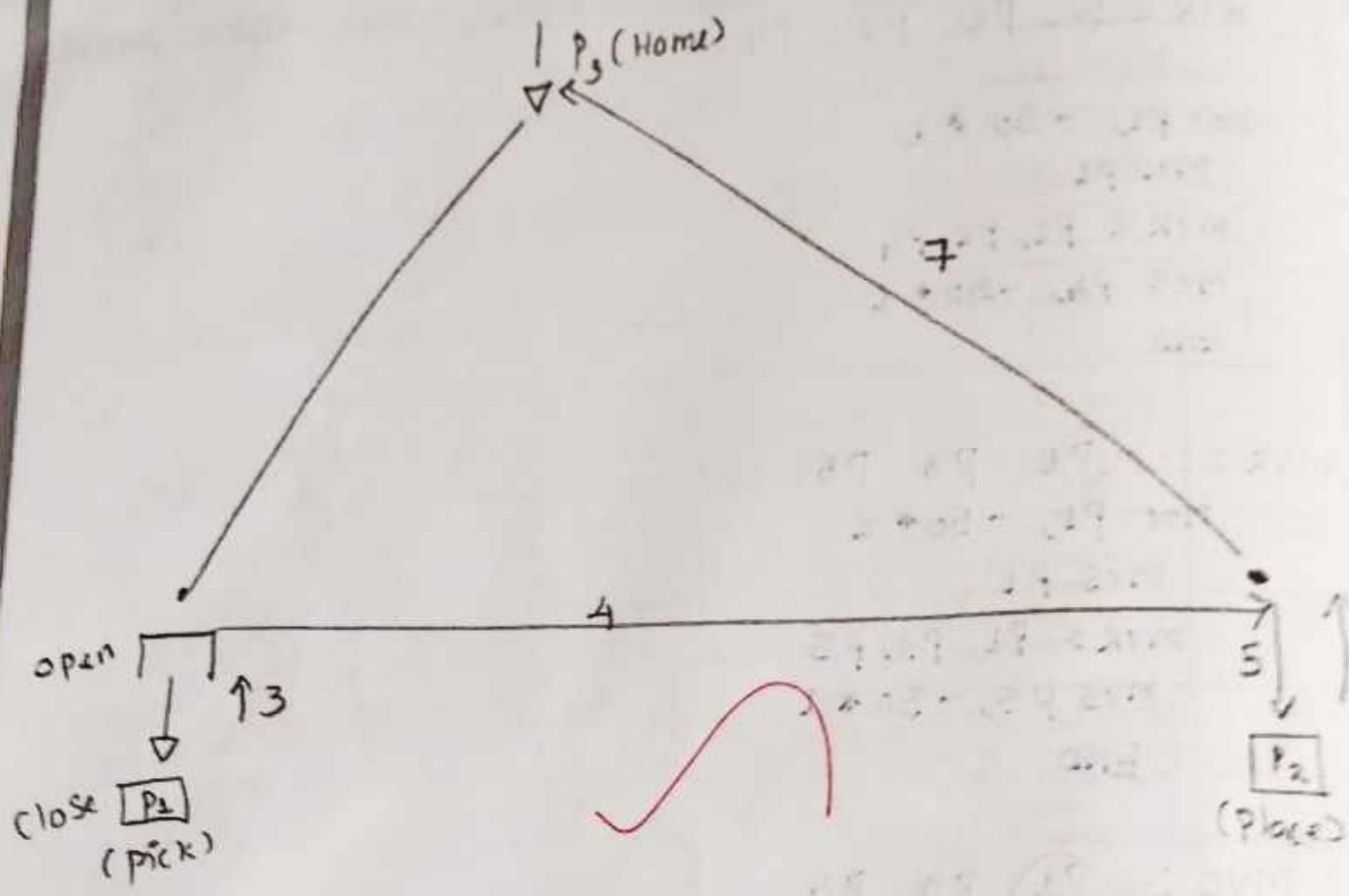
LEARNING OBJECTIVES:-

TO write and execute a robot program to

Pick and place the robot.

PROCEDURE:-

- * Launch RT toolbox 3, Create a new file, Setup the Program file.
- * Go to online right click the program and create a new program.
- * Add 3 points P₁, P₂, P₃, are moves for the different positions and stored in current position value of the robot in the respective's value box.
- * P₁, pick up the object, P₂ places the object and P₃ is the home positions of the robot.
- * Mainly the H OPEN, H CLOSE Commands for gripping position of the robot.
- * Add the program on the program files, Run the program and See the robot's moving accordingly, as per your instructions.



RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41b12006	Name	ARTHIKA A
Dept.	CSE AI & ROBOTICS	Year/Sem	I st year / VI Sem
Exp. Name	PICK AND PLACE THE ROBOT		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)	05/04/24	Marks Secured (Out of 10)	10		
Date of Experiment Actual	05/04/24				
Date of Submission of Observation Note Book	08/04/24				
Date of Submission of Record Note Book	12/04/24				


 Signature of the Lab Handling Faculty

PROGRAM CODE :-

MVS P1, -200 * 1

H OPEN 1

DLY 2

MVS P1

H CLOSE 1

DLY 2

MVS P1, -200 * 1

MVS P2, -200 * 1

MVS P2

H OPEN 1

DLY 2

MVS P2, -200 * 1

MVS P3

END

~~DATA~~RESULT :-

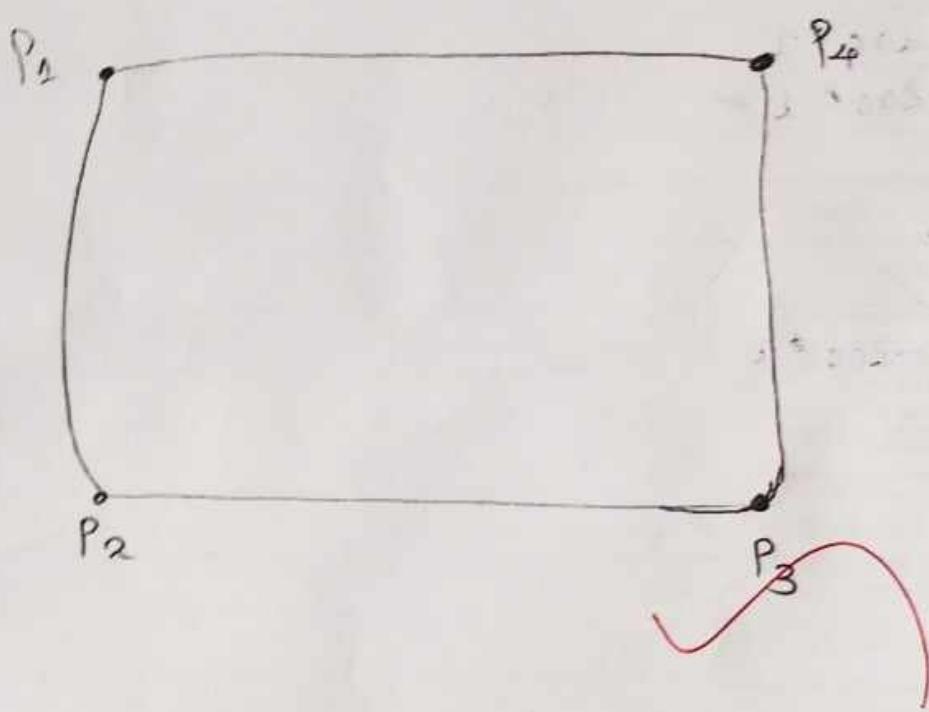
In this experiment, a robot programming was written and executed successfully to move the robot using pick & placing the operation.

LEARNING OBJECTIVES:-

To write and execute a robot program to continuous motion.

PROCEDURE:-

- * Launch RT Toolbox 3, Create a new file, set up Program file.
- * Go to online right click the program and create a new program.
- * Add 4 points p_1, p_2, p_3, p_4 are moves for the different positions are stored in current position value of the robot in the respective value box.
- * The robot starts the p_1 position to moves continuously to p_4 as per given instructions.
- * Add the program on the program files, Run the program and See the robot's moving accordingly, as per your instructions.



RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	J11612006	Name	ARTHIKA A
Dept:	CSE AT 4 ROBOTICS	Year/Sem	III rd Yr VI Sem
Exp. Name	Robot Programming WITH CONTINUOUS MOTION		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)	05/04/24	Marks Secured (Out of 10)			
Date of Experiment (Actual)	05/04/24				
Date of Submission of Observation Note Book	08/04/24				
Date of Submission of Record Note Book	12/04/24				


Signature of the Lab Handling Faculty

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Expt. Name _____

Date : _____

Program Code :-

CNT 1

MVS P1

MVS PR

MVS P3

MVS P4

CNT 0

END

✓ ✓

RESULT :-

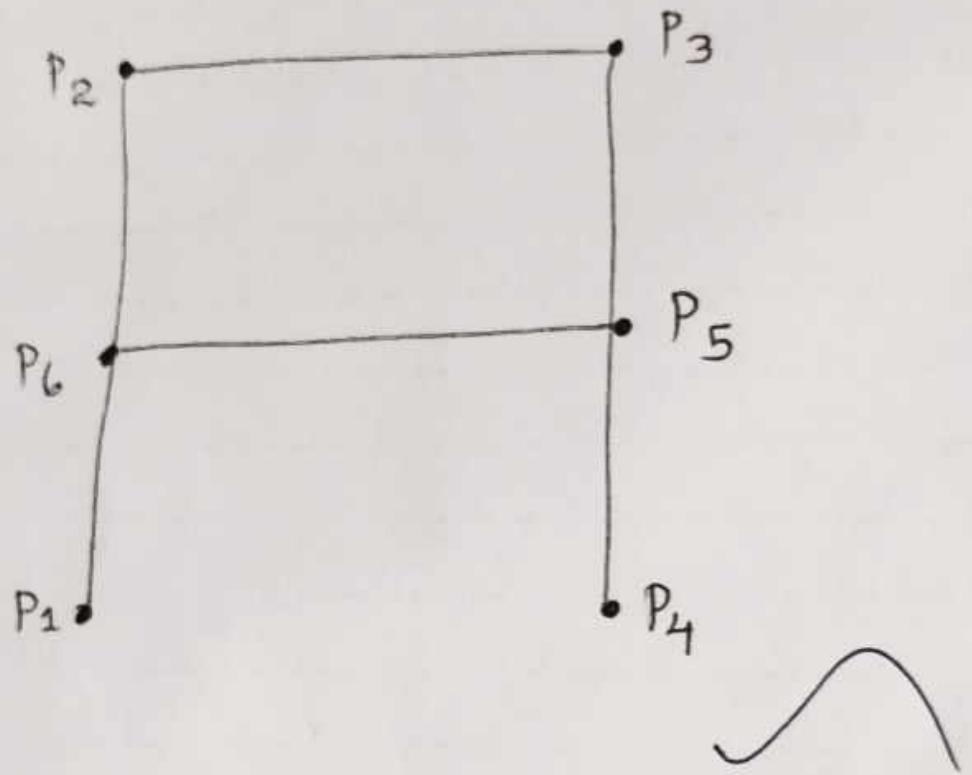
In this experiment, a robot program was written and executed successfully to move the robot using continuous motion.

LEARNING OBJECTIVES:-

To trace the letter using robot programming to execute the tracing.

PROCEDURE:-

- * Launch RT Toolbox 3, create a new file, setup the program file.
- * Go to online right click the program and create a new program.
- * Add 6 points P₁, P₂, P₃, P₄, P₅, P₆ for the different positions and stored in current position value of the robot in the respective value box.
- * The robot starts the P₁ position to trace the letter to P₆ as per instructions.
- * Add the program on program files, run the program and see the robot's moving accordingly, as per your instructions.



RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	ARTHIKA · A
Dept.	CSE AI & ROBOTICS	Year/Sem	III rd Y / VI Sem
Exp. Name	LETTER TRACING USING ROBOT PROGRAMMING		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)	12/04/24			Marks Secured (Out of 10)	10
Date of Experiment (Actual)	12/04/24				
Date of Submission of Observation Note Book	12/03/24				
Date of Submission of Record Note Book	19/04/24				


 Signature of the Lab Handling Faculty

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Expt. Name _____

Date : _____

PROGRAM CODE :-

MVS P1

MVS P2

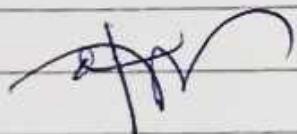
MVS P3

MVS P4

MVS P5

MVS P6

End



RESULT :-

In this experiment, a robot program was written and executed successfully to move the robot using to tracing the letter.

LEARNING OBJECTIVES:-

To operate or control mitsubishi RV 8CRL robot manually using teach pendant.

PROCEDURE:-

- * Turn on the robot and check on the control unit, it is in manual mode.
- * Enable switch on back top of the teach pendant this ensures the connection of the teach pendant.
- * Hold the clutch switch on back of the teach pendant gently till you hear a tick sound. The robot turns off if you leave the clutch or if you hold it too hard.
- * Click on servo button after jog mode, now choose the buttons on the robots to move the basis X, Y, Z, A, B, C
- * Click on F1 button to switch between cartesian coordinate system and point co-ordinate system.
- * After using turn off the robot.

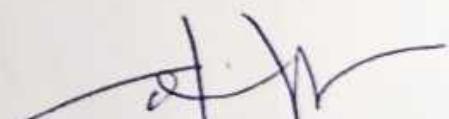
RESULT:-

In this experiment, the robot program was written and executed successfully to manually operate the robot.

RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	A. ARTHIKA
Dept.	B.E. CSE AI & ROBOTICS	Year/Sem	1 ¹¹ rd Year VI Sem
Exp. Name	MANUAL CONTROL OF ROBOT USING TEACH PENDENT		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)		12/04/24	Marks Secured (Out of 10) 10		
Date of Experiment (Actual)		12/04/24			
Date of Submission of Observation Note Book		18/04/24			
Date of Submission of Record Note Book		18/04/24			

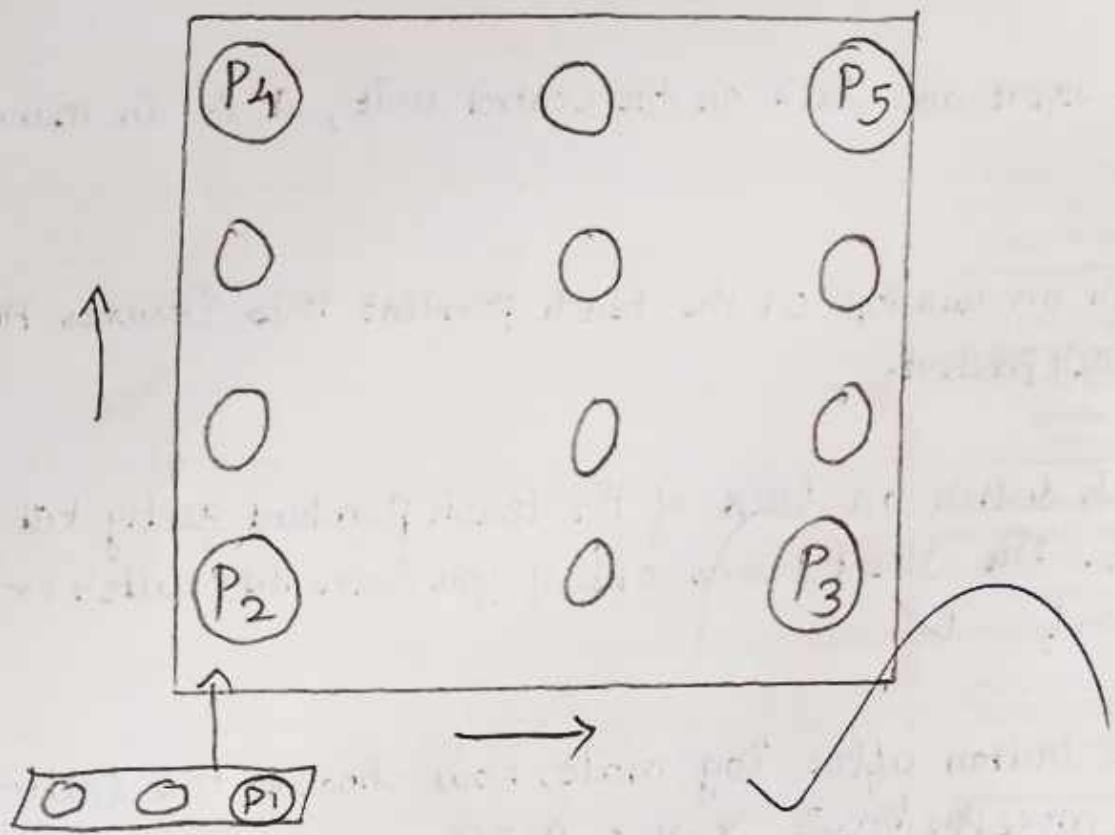


AIM:-

TO Execute the robot programming using rectangular palletization.

PROCEDURE:-

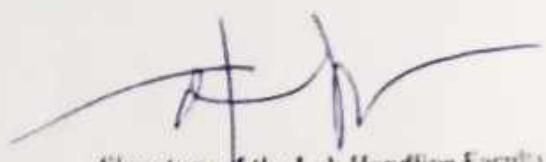
- * Launch RT toolbox 3, create a new file, Set up the program file.
- * Go to online right click the program and create a new program.
- * Add 5 points P₁, P₂, P₃, P₄, P₅ for the different positions and stored in current position Value of the robot in the respective value box.
- * The robot starts the P₁ position to palletizing the rectangular position to P₅.
- * Add the program on program files, Run the program and see the robot's moving accordingly, as per your instructions.



RUBRIC FOR ROBOT PROGRAMMING LAB (SMRA2002)

Reg No:	41612006	Name:	ARTHIKA A
Dept.	BE-CS & AI & ROBOTICS	Year/Sem:	1 st Year VI Sem
Exp. Name	ROBOT PROGRAMMING USING RECTANGULAR PATTERN		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)		16/04/24	Marks Secured (Out of 10)		
Date of Experiment (Actual)		16/04/24			
Date of Submission of Observation Note Book		18/04/24			
Date of Submission of Record Note Book		22/04/24			



Signature of the Lab Handling Faculty

PROGRAM CODE:-

DEF PLT 1, P2, P3, P4, P5, 3, 4, 2
M1 = 1

* LOOP

MVR P1, -100 * 1

MVS P1

H CLOSE 1

DLY 2

MVS P1, -100 * 1

P10 = (PLT1, M1)

MVR P10, -100 * 1

MVS P10

H OPEN 1

DLY 2

MVS P10, -100 * 1

M1 = M1 + 1

IF M1 <= 12 THEN * Loop

END

~~S. V.~~

RESULT:-

Thus the palletization program was executed successfully.

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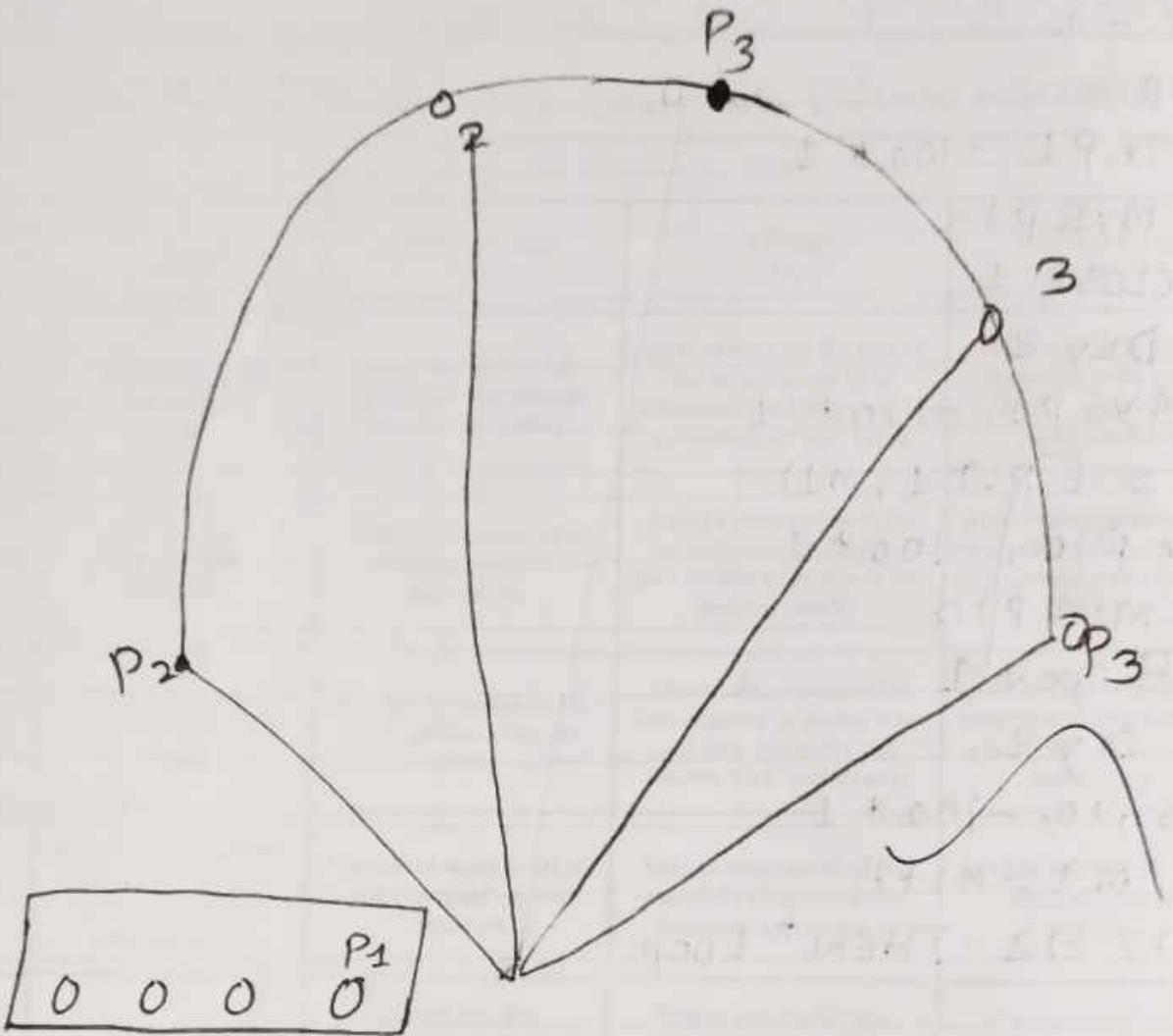
Expt. Name ROBOT PROGRAMMING USING CIRCULAR PALLETIZATION Date 16/02/24

AIM:-

TO Execute the Robot programming using circular palletization.

PROCEDURE:-

- * Launch RT toolbox 3, create a new file , set up the program file.
- * Go to online right click the program and create a new program.
- * Add 4 points P1, P2, P3, P4 for the different positions and stored in current position value of the robot in the respective boxes.
- * The robot starts the P1 position to palletize, the circular position to P4
- * Add the program on program files, Run the program and see the robot's moving accordingly as per your instructions.



RUBRICS FOR ROBOT PROGRAMMING LAB (SMRA2602)

Reg No:	41612006	Name	ARTHIKA · A
Dept.	B.E.CSE AI & ROBOTICS	Year/Sem	III rd Y / VI SEM
Exp. Name	ROBOT PROGRAMMING USING CIRCULAR PALLETIZATION		

No.	Criteria	Below Average (0)	Average (1)	Above Average (2)	Score
1	Understand the Experiment	Unable to explain both aim of the experiment, and the procedure.	Able to explain the aim of the experiment to an adequate level, but not the procedure or vice versa.	Able to explain the aim of the experiment and the procedure to an adequate level.	2
2	Conduct the Experiment/ Simulation	Unable to start/conduct the experiment/ simulation.	Able to start/conduct the experiment/ simulation, but unable to produce the desired results.	Able to start/conduct the experiment/ simulation, and produce the desired results.	2
3	Communication/ Demonstration to Peers	Unable to demonstrate the experiment to the peers.	Able to demonstrate the experiment to peers, but not able to clarify the doubts with confidence.	Able to demonstrate the experiment to peers, and clarify the doubts with confidence.	2
4	Report writing (Aim, procedure, figures, tables and model calculations)	Unable to write most of the required report elements.	Able to write most of the required report elements, but some are missing.	Able to write all the required report elements.	2
5	Timeliness	Absent for the experiment on scheduled date, and unable to finish the observation and record work before the due date.	Either absent for the experiment on the scheduled date, or failed to submit the observation and record work before the due date.	Able to complete the experiment on the scheduled date, and submit the observation and record work before the due date.	2
Date of Experiment (Scheduled)		16/04/24	Marks Secured (Out of 10)		
Date of Experiment (Actual)		16/04/24			
Date of Submission of Observation Note Book		18/04/24			
Date of Submission of Record Note Book		22/04/24			

Expt. No. _____

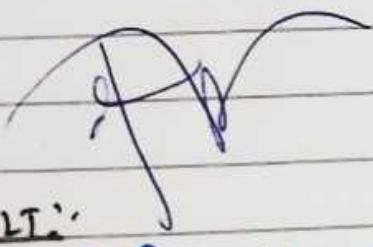
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Expt. Name _____

Date : _____

PROGRAM CODE:

```
DEF PLT Z, P2, P3, P4, 1, 4,3  
M1 = 1  
+ LOOP  
MOV P1, -100+1  
MVS P1  
HCLOSE 1  
DLY 2  
MVS P1, -100+1  
P10 = (PLT 1, M1)  
MOV P10, -100+1  
MVS P10  
HOPEN 1  
DLY 2  
MVS P10, -100+1  
M1 = M1+1  
IF M1 <= 4 THEN * LOOP  
END
```



RESULT:

Thus the palletization program using circular path was executed successfully.