

ECE 763

Homework #2

Problem:

A program for the Mitsubishi robot is to be written that allows it to pick up 3 parts from an indexing conveyor, in succession, and place each on an output conveyor. The task makes use of 5 basic positions:

- (1) Position 0 (Home) – an intermediate position between the pick-up and drop-off conveyors.
- (2) Position 1 – a point above the pick-up point at the indexing conveyor.
- (3) Position 2 – at the pick-up point on the indexing conveyor.
- (4) Position 3 – a point above the drop-off point at the output conveyor.
- (5) Position 4 – at the drop-off point on the output conveyor.

It may be necessary to define other positions since the gripper may be open or closed as it passes through each of these positions depending upon whether a part is in hand or not.

After RESET and NEST, the operation is to proceed as follows:

- (1) Move to the Home position.
- (2) Signal to the indexing conveyor that the arm is ready for a part.
- (3) Wait for the conveyor to index.
- (4) Move through this sequence of positions – 0 - 1 - 2 - 1 - 0 - 3 - 4 - 3 - 0. The gripper should be open when it does not have a part.

The sequence is to be repeated 3 times, with the task ending at the Home position.

To signal to the indexing conveyor that the arm is ready for a part, the following command is appropriate:

OD &01.

(over)

The indexing conveyor has begun to be indexed when input bit 0 is 1. (Use the ID and TB commands to check the conveyor status.) For proper synchronization, the arm should wait for 3 sec. before beginning to move to the pick-up area.

When moving up or down, the speed should be set at approximately one-half the maximum while movement between other positions (lateral movement) should be at the maximum speed. When opening or closing the gripper, the pressure should be set at the maximum for 2 sec. and then go to next to the minimum pressure.

Let the coordinates for the Home position be given as follows:

(-6000,-4000,3600,0,0).

The coordinates for the other positions (relative to the Nest position) are:

(1) Pos. 1 – (-9600,-3168,1600,-405,-795)

(2) Pos. 2 – (-9600,-3424,1653,-372,-828)

(3) Pos. 3 – (-2400,-3168,1600,795,405)

(4) Pos. 4 – (-2400,-3424,1653,828,372)

Write the program using the Mitsubishi commands accurately and efficiently. Provide comments for every few commands.