MATLAB Code:

```
clc
clear all
% defining parameters of DH table
a = [0 0.249 0.141 0 0];% link lengths
al = [pi/2 0 0 pi/2 0];% twist between links
d = [0 0 0 0 0.098];%offset
theeta = [0 pi/4 -pi/4 pi/3 pi/2];%angle between links
% Storing angles( both coordinates)for each link in an array
c1 = [cosd(theeta(1)) cosd(theeta(2)) cosd(theeta(3)) cosd(theeta(4))
cosd(theeta(5))];
s1 = [sind(theeta(1)) sind(theeta(2)) sind(theeta(3)) sind(theeta(4))
sind(theeta(5))];
c2 = [cosd(al(1)) cosd(al(2)) cosd(al(3)) cosd(al(4)) cosd(al(5))];
s2 = [sind(al(1)) sind(al(2)) sind(al(3)) sind(al(4)) sind(al(5))];
% transformation matrix for each link
T1 = [c1(1) -s1(1) 0 0; s1(1)*c2(1) c1(1)*c2(1) -s2(1) d(1)*-s2(1);
s1(1)*s2(1) c1(1)*s2(1) c2(1) d(1)*c2(1); 0 0 0 1];
T2 = [c1(2) -s1(2) 0 0.249; s1(2)*c2(2) c1(2)*c2(2) -s2(2) d(2)*-
s2(2); s1(2)*s2(2) c1(2)*s2(2) c2(2) d(2)*c2(2); 0 0 0 1];
T3 = [c1(3) -s1(3) 0 0.141; s1(3)*c2(3) c1(3)*c2(3) -s2(3) d(3)*-
s2(3); s1(3)*s2(3) c1(3)*s2(3) c2(3) d(3)*c2(3); 0 0 0 1];
T4 = [c1(4) -s1(4) 0 0; s1(4)*c2(4) c1(4)*c2(4) -s2(4) d(4)*-s2(4);
s1(4)*s2(4) c1(4)*s2(4) c2(4) d(4)*c2(4); 0 0 0 1];
T5 = [c1(5) -s1(5) 0 0; s1(5)*c2(5) c1(5)*c2(5) -s2(5) d(5)*-s2(5);
s1(5)*s2(5) c1(5)*s2(5) c2(5) d(5)*c2(5); 0 0 0 1];
% transformation of whole system/robot
 T = T1*T2*T3*T4*T5;
%link command to contact coordinate of each joint
L(1) = Link([theeta(1) d(1) a(1) al(1)]);
L(2) = Link([theeta(2) d(2) a(2) al(2)]);
L(3) = Link([theeta(3) d(3) a(3) al(3)]);
L(4) = Link([theeta(4) d(4) a(4) al(4)]);
L(5) = Link([theeta(5) d(5) a(5) al(5)]);
SCORBOT = SerialLink(L);
% command for forward kinematics from base to gripper
robot = fkine(SCORBOT, [theeta(1) theeta(2) theeta(3) theeta(4)
theeta(5)])
SCORBOT.name = 'Service Robot';
%plotting the robot
SCORBOT.plot([theeta(1) theeta(2) theeta(3) theeta(4) theeta(5)]);
title('Service Robot');
```

Final Transformation Matrix:

```
robot =

        0    -0.5000     0.8660     0.4019
       -1          0          0          0
        0    -0.8660    -0.5000     0.1271
        0          0          0          1

>>
```

Service Robot:

Service Robot