VIT

Vellore Institute of Technology

Continuous Assessment Test – I

FALL Weekend Intra Semester 2019-2020

Programme Name & Branch: B TECH & Common to all **Exam Duration:** 90 mins **Slot:** B1

Course Code: MEE1030

Faculty Name: Dr Sudhir Raj **Course Title:** ROBOTICS

Maximum Marks: 50

General instruction(s):

Answer all the questions

S.No.	Question
	Section – A (10 x 2 = 20 Marks)
1	Calculate the degrees of freedom for slider crank mechanism.
2	Define Jacobian matrix with suitable example.
3	Define Denavit Hartenberg parameter of a robot with neat sketches.
4	Define any gripper used in the robot.
5	Describe the types of joints used in a robotic manipulator with neat sketches.
6	List the difference between Forward and Inverse kinematics?
7	Explain industrial robot.
8	What is an end effector?
9	List the difference between a prismatic and revolute joint?
10	List the difference between pneumatic and hydraulic actuator?
	Section – B (3 x 10 = 30 Marks)
1	Determine the homogeneous transformation matrix if frame B is rotated relative to frame A through an angle of 30° about Z axis and translated 10 units in X_A and 5 units in Y_A.
2	(I)Define workspace (II) Calculate the joint angles for two link planar manipulator.
3	Figure 1 shows the linkage mechanism and dimensions of a gripper used to handle a work part for a machining operation. The gripping force required to handle the work part is 25 lb. Calculate the actuator force required.

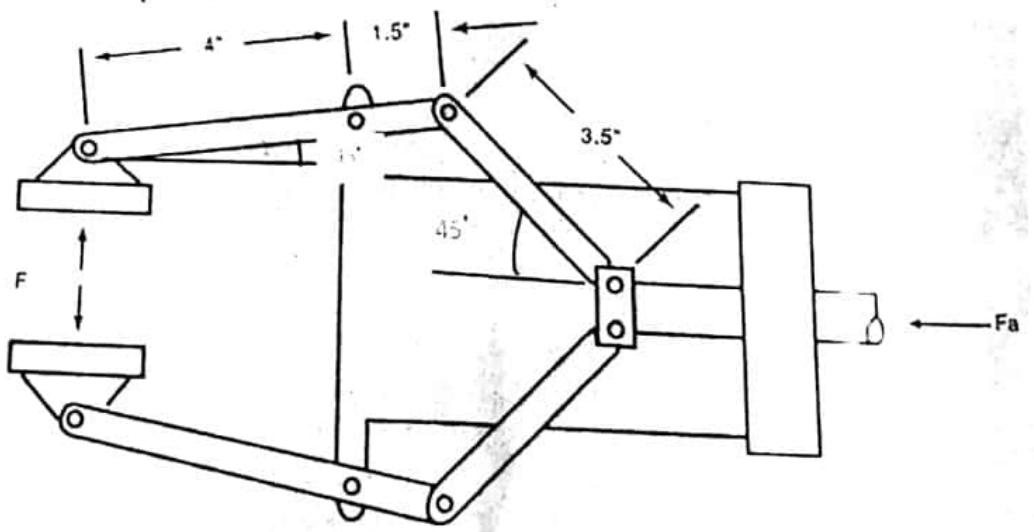

Figure 1