

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Programme Name: B. Tech MSNT

Semester : VII

Course Name : Nano Electronics & Robotics

Time : 03 hrs

Course Code : MTEG 422

Max. Marks : 100

Nos. of page(s) :2

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Describe the significance of Jacobian calculation in manipulator.	4	CO3
Q 2	List the advantage of electrical drive used in robotics application compared to hydraulic drive and pneumatic drive.	4	CO2
Q 3	Describe the drawback of D_H parameters for assigning the frame of reference in manipulator.	4	CO1
Q 4	Explain the boundary & configuration singularities in manipulator.	4	CO3
Q 5	List the application of Nano robot in surgery.	4	CO1

SECTION B

Q 6	Armature control motor is used in the control of movement of joint in the manipulator. Formulate the expression for the applied voltage and joint position of the manipulator.	10	CO3
Q 7	Optical encoders are used for finding the position of joint in the manipulator . Explain the working principle of optical encoder.	10	CO2
Q 8	Explain the principle of hydraulic gripper.	10	CO2

Q 9	Describe the effect of oscillation of robotics application in material handling operation. OR Explain the concept of trajectory planning to avoid the jerk and plan smooth motion	10	CO3
SECTION-C			
Q 10	Describe the robot control architecture for an n-DOF manipulator	20	CO4
Q 11	Explain adaptive control system for robot control scheme. OR Explain the hybrid control system for robotics spray painting application.	20	CO4

