

Code No: 57026

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February/March - 2016

ROBOTICS

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions  
All Questions Carry Equal Marks

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1. Describe the types of mechanical grippers, their selection and design aspects. [15]
2. Represent the Euler angle rotations. Describe the 1<sup>st</sup>, 2<sup>nd</sup> and RPY system of Euler angles. [15]
3. Describe the Kinematic parameters of SCARA robot representing the D-H matrices. [15]
4. Discuss the general procedure for solving 6R inverse kinematic problem. [15]
5. Explain about the equations formulated based upon the Lagrange Euler formulations. [15]
- 6.a) Discuss the various parameters considered in the trajectory planning.  
b) Discuss the boundary conditions and formulation of trajectory planning with 3<sup>rd</sup> order polynomial. [8+7]
7. Briefly describe about the pneumatic and hydraulic actuators. [15]
8. Describe the robot's application in material handling system in a manufacturing industry. [15]

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