

Code No: 136FC**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year II Semester Examinations, November/December - 2020****FUNDAMENTALS OF ROBOTICS****(Common to CE, ECE, AE)****Time: 2 hours****Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1. What are the different types of sensors used in robots? Explain the suitable sensor to measure the position of the gripper accurately. [15]
- 2.a) Explain the classification of robots by different controlling methods.
b) Define work volume and load carrying capacity with reference to robot. [7+8]
3. Explain the applications of robots in detail for various assembly and inspection operations in an industrial environment. [15]
- 4.a) With a neat sketch explain the magnetic gripper and list its advantages and limitations.
b) What are future manufacturing applications of robot? [8+7]
5. Derive the forward kinematics equation using the DH convention for the two-link manipulator with one revolute and one prismatic joint. [15]
6. Explain the inverse kinematics for any manipulator based on D-H convention. [15]
- 7.a) Explain tasks involved in trajectory planning. Discuss the Cartesian space techniques used for trajectory planning.
b) With the help of diagram, show the elements of feedback control system. [7+8]
- 8.a) Discuss the structure, elements and functions of any one Robot Language.
b) Differentiate Manual lead through and powered lead through in robot programming. [7+8]

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