

R09

Code No: D6303

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
ROBOTICS AND MACHINE VISION
(IMAGE PROCESSING)**

Time: 3hours

Max. Marks: 60

**Answer any five questions
All questions carry equal marks**

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- 1.a) Explain the robot anatomy and the characteristics of human arm.
- b) What are homogeneous transformation matrices? Discuss their significance with suitable examples.
- 2.a) Explain the Denavit-Hartenberg notation and the Euler angles.
- b) Explain about Jacobian inverse and Jacobian singularities and bring out their significance in Robotics.
3. Explain about open and closed loop control and force control strategies.
4. Explain the Canny edge detection technique and Shen – Castan edge detection techniques with suitable examples and compare.
- 5.a) State and explain various areas of applications of edge detection.
- b) What is meant by gray scale image, binary image and color image? Give suitable examples and compare their features.
- 6.a) What is meant by gray – level segmentation? Discuss the relaxation methods for it?
- b) What is a skeleton? Discuss about medial – axis transform.
- 7.a) What is meant by thinning? Explain the force based thinning method.
- b) State and explain various 2D Wavelets.
8. Write short notes on the following
 - a) OCR
 - b) RPY representation
 - c) Symbol Recognition
