Code No: D5506

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech II - Semester Examinations, March/April 2011
ROBOTICS
(EMBEDDED SYSTEMS)

Time: 3hours   **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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1. a)   Discuss the application of gantry and arm type robots in the automobile industry?
   b)   Explain the control programs of the robots.   [6+6]

2. a)   Explain with the neat sketches offset and in-line wrist of robots?
   b)   Discuss the different geometrical configurations of robots.   [6+6]

3. a)   Derive the basic rotation matrix?
   b)   Derive the 4×4 d-h transformation matrix.   [6+6]

4.   Explain the inverse kinematic analysis of any spatial 3 dof by choosing a link parameter
         table.   [12]

5. a)   Explain the time of flight range finders.
   b)   Discuss about RFID.   [6+6]

6. a)   Explain the working of hydraulic and pneumatic type actuators.
   b)   Discuss about Piezo-electric and infrared sensors.   [6+6]

7. a)   What is a stepper motor? Explain.
   b)   Discuss about incremental encoders?   [6+6]

8. a)   What are the characteristics of task level languages? Explain.
   b)   Discuss the workplace design considerations for safety?   [6+6]

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