

GUJARAT TECHNOLOGICAL UNIVERSITY
M.E. – SEMESTER – IV EXAMINATION – OCTOBER 2012

Subject code: 742801**Date: 25-10-2012****Subject Name: Robotics & Control****Time: 2:30 pm – 5:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define robot anatomy and also narrate robot configuration. **07**
(b) Elaborate following terms. **07**
(i) Spatial resolution , (ii) accuracy , (iii) repeatability
(iv) Compliance

- Q.2** (a) Describe basic controllers used in Robot **07**
(b) Write different types of position sensors used in robot. **07**
Explain any two in detail.

OR

- (b) Determine the control resolution for the axis of motion of **07**
one sliding joint with full range of 1 m and robot's control
memory has a 12 bit storage capacity.

- Q.3** (a) Explain homogeneous transformation matrix and joint and **07**
link parameters.
(b) What is dynamic performance of robot? Explain robot arm **07**
dynamics.

OR

- Q.3** (a) What is end effector? Discuss mechanical end effectors. **07**
(b) What is output value of an absolute encoder if the shaft **07**
angle is 1 rad and encoder has 8 tracks?

- Q.4** (a) Short note on Magnetic Grippers. **07**
(b) Write down considerations in gripper selection and design. **07**

OR

- Q.4** (a) Which are the desirable features of sensors used in **07**
robotics?

- Q.4** (b) Short note on Tactile sensors. **07**

- Q.5** (a) Enlist uses of sensors in robotics. **07**
(b) How machine vision is working in robot? **07**

OR

- Q.5** (a) Discuss different illumination techniques. **07**
(b) Explain analog to digital signal conversion. **07**
