Seat No.:	Enrolment No.

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

Date: 25-10-2012 Subject code: 742801 **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. (a) Define robot anatomy and also narrate robot configuration. **Q.1** 07 Elaborate following terms. 07 (i) Spatial resolution, (ii) accuracy, (iii) repeatability (iv) Compliance (a) Describe basic controllers used in Robot **07 Q.2 (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 (a) What is end effector? Discuss mechanical end effectors. Q.3 07 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 (a) Which are the desirable features of sensors used in **Q.4 07** robotics? **(b)** Short note on Tactile sensors. **Q.4** 07 (a) Enlist uses of sensors in robotics. 07 **Q.5 (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
