

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. Sem. – IInd - Examination – June/July- 2011****Subject code: 1720803****Subject Name: Robotic Engineering****Date: 27/06/2011****Time: 10:30 am – 01:00 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) Enlist different types of drives used in robotic system. Explain each in detail. **07**
- (b) Discuss advantages and disadvantages of Cartesian robots over other geometric configuration of robots. **07**

- Q.2** (a) Explain in detail “D-H representation of forward kinematics” with algorithm. **07**
- (b) Explain configuration of robot controller. **07**

OR

- (b) Define and explain following terms. **07**
1. Spatial resolution
 2. Accuracy
 3. Repeatability
 4. Compliance

- Q.3** (a) Give basic types of encoders used in robotic control system. Explain each in detail. **07**
- (b) Write short note on – “Proximity and range sensors”. **07**

OR

- Q.3** (a) Describe image processing and analysis in detail for robotic vision system. **07**
- (b) With neat sketch explain methods of defining positions in space. **07**

- Q.4** (a) Discuss in details on different commands used in robot programming. **07**
- (b) Explain different factors which influence the selection and design of grippers. **07**

OR

- Q.4** (a) Explain robot language structure in detail. **07**
- (b) Explain in detail “Robot centered cell” with its layout. **07**

- Q.5** (a) Explain “Remote Centered Compliance (RCC)” device for assembly operation. **07**
- (b) Explain application of robot in Spray coating operation. Also write benefits of it. **07**

OR

- Q.5** (a) Explain analog to digital signal conversion for machine vision system. **07**
- (b) Write short note on “Robot intelligence”. **07**
