

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1725008**Date: 05-06-2013****Subject Name: Rapid Prototyping****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) Differentiate product development cycle with new product development cycle. **07**
(b) Discuss design for assembly and manufacturing. **07**

- Q.2** (a) Explain types of geometric models and why CAD model is required to convert into STL file format in RP process. **07**
(b) How data points are acquired in reverse engineering? Explain various methods. **07**

OR

- (b) Describe the finite element methodology with an example. **07**
- Q.3** (a) What is canned cycle? Explain with neat sketches the differences between the operation of the canned cycles G73 and G83. **07**
(b) Describe the classification of Robots and explain any two with neat sketches. **07**

OR

- Q.3** (a) Describe the Generative type CAPP system. **07**
(b) Classify in detail the rapid tooling processes. **07**
- Q.4** (a) Describe the components of CIM. **07**
(b) Define product data management and Write the benefits it. **07**

OR

- Q.4** (a) Explain concurrent engineering system architecture. **07**
(b) Write the difference between virtual reality and augmented reality? List the devices used for both. **07**

- Q.5** (a) Explain with neat sketch the stereolithography process. **07**
(b) A prototype of a tube with a square cross section is to be fabricated using fused deposition method. The outside dimension of the square = 100 mm and the inside dimension = 90 mm. The height of the tube (z-direction) = 80 mm. Layer thickness is to be 0.20 mm and the width of the extrudate deposited on the surface of the part = 1.25 mm. The extruder work-head moves in the x-y plane at a speed of 150 mm/s. A delay of 10 s is experienced between each layer to reposition the work-head. Compute the time required to build the part. **07**

OR

- Q.5** (a) Explain with neat sketch the selective laser sintering process. **07**
(b) A prototype of a tube with a square cross section is to be fabricated using stereolithography. The outside dimension of the square = 100 mm and the inside dimension = 90 mm. The height of the tube (z-direction) = 80 mm. Layer thickness = 0.10 mm. The diameter of the laser beam (spot size) = 0.25 mm, and the beam is moved across the surface of the photopolymer at a velocity of 500 mm/s. Compute an estimate for the time required to build the part, if 10 s are lost each layer to lower the height of the platform that holds the part. **07**