Enrolment No._____

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

Subject code: 1725008		code: 1725008 Date: 05-06-2013	
Su	bject	Name: Rapid Prototyping	
Tir	ne: 1	0.30 am – 01.00 pm Total Marks: 70	
Ins	struc	tions:	
		 Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q.1	(a) (b)	Differentiate product development cycle with new product development cycle. Discuss design for assembly and manufacturing.	07 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. OR	07
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
0.4	(a)	Explain concurrent engineering system architecture.	07
χ···	(b)	Write the difference between virtual reality and augmented reality? List the devices used for both.	07
Q.5	(a) (b)	Explain with neat sketch the steriolithography process. 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 (<i>z</i> -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 <i>x-y</i> 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. OR	07 07
Q.5	(a) (b)	Explain with neat sketch the selective laser sintering process. 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 (õspot sizeö) = 0.25 mm, and the beam is moved across the surface of the photopolymer at a velocity of	07 07

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.