Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1720808 **Date: 02-01-2014**

Subject Name: Manufacturing Processes and Analysis

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)**	Describe upper bound analysis for metal forming process.	**07**
	(b)	Explain working principle of laser machining. What are the source of energy and transfer medium in this process? Give specific application of laser machining.	**07**
Q.2	**(a)**	What is rapid prototyping? Explain fused-deposition modeling with neat schematic diagram.	**07**
	(b)	With neat sketch discuss design for casting process.	**07**
		OR	
	(b)	What is the method for calculation of size of welds for static and dynamic loading?	**07**
Q.3	**(a)**	What are the basic principle, application and advantages of hot machining and cryogenic machining?	**07**
	(b)	Classified metal forming processes. Discuss forces and geometrical relationship in rolling process.	**07**
		OR	
Q.3	**(a)**	Differentiate between following. (i) Drilling and Deep hole drilling (ii) Machining and Micromachining	**07**
	(b)	Discuss following terms in reference to plastic deformation: 1. Deformation zone 2. Hydrostatic pressure 3. Workability 4. Residual stresses	**07**
Q.4	**(a)**	Describe ultrasonic machining process with neat sketch. Discuss how the following factors effects the material removal rate of USM. 1. Grain Size 2.Concentration of slurry 3. Frequency of vibration 4. Amplitude 5. Feed force 6. Hardness ratio	**07**
	(b)	Give explanation of vacuum casting method. What are the sources of fluctuation in the properties of cast material during vacuum casting?	**07**
		OR	
Q.4	**(a)**	Give analysis of continuous casting process.	**07**
	(b)	What are the importance of location and orientation for weld assembly? Explain role of residual stresses at weld joint.	**07**
Q.5	**(a)**	Discuss laminated-object manufacturing methods.	**07**
	(b)	Give the analysis of electrical discharge machining.	**07**
		OR	
Q.5	**(a)**	What is DFX? Write steps of stereo-lithography?	**07**
	(b)	Define weldability? Give analysis of stresses in welded structures.	**07**

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