Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject code: 1720808 **Date: 05-06-2013**

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)**	Analyze the metal drawing process using slab method with appropriate equations.	**07**
	(b)	The strain hardening of an annealed metal is expressed by $\dot{u} = 1400\ \dot{U}^{0.5}$, where stress is in MPa. A 25 mm diameter bar is drawn down to 20 mm and 15 mm in two steps using tapered cylindrical dies. Determine the plastic work per unit volume for each reduction.	**07**
Q.2	**(a)**	Explain the Investment Casting process with advantage, disadvantage and applications.	**07**
	(b)	Discuss in detail the causes and effects of residual stresses in cast piece.	**07**
		OR	
	(b)	Differentiate between true centrifugal casting process and semi centrifugal casting process. Explain with sketches how very large gray iron pipes are cast using the centrifugal process.	**07**
Q.3	**(a)**	Discuss the thermal effects of the welding process upon the structure and properties of the base metal.	**07**
	(b)	Discuss the weldability of various metals and explain why some metals are easier to weld than others.	**07**
		OR	
Q.3	**(a)**	Describe the factors that contribute to the difference in properties across a welded joint.	**07**
	(b)	Give detailed explanation of various process variables for AJM. Also explain the effect of stand off distance on accuracy of shape produced.	**07**
Q.4	**(a)**	Why cryogenic coolants are preferred over the conventional coolants? Explain the working principle of cryogenic machining and its limitations.	**07**
	(b)	Completely describe the LBM process in context of basic mechanism, transfer media, energy source and process.	**07**
		OR	
Q.4	**(a)**	Explain photo lithography with its advantages and limitation.	**07**
	(b)	Describe the various types of metal spinning processes. Also differentiate between conventional and shear spinning processes with neat sketch.	**07**
Q.5	**(a)**	What is Rapid Prototyping? Describe itôs fundamental procedural steps.	**07**
	(b)	Completely explain three dimensional printing with sketch.	**07**
		OR	
Q.5	**(a)**	Explain Fused deposition modeling and Selective laser sintering.	**07**
	(b)	Evaluate: The operations of cleaning and finishing cannot be ignored in RP processes.	**07**

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