Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 710807N

Subject Name: Advanced Materials and Processes

Date: 03 /02 /2011 **Time: 02.30 pm – 05.00 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)**	What are the analytical methods of materials selections? Describe any one method.	**07**
	(b)	Explain the term "Design for manufacturability". Write the guidelines to achieve better manufacturability and give one suitable example for any one guideline that you have mentioned.	**07**
Q.2	**(a)**	List the general "Design-for-Machining" rules and justify the "minimize the number of machined orientation" rule with suitable example.	**07**
	(b)	What do you mean by magnetorheological fluids? Write applications with one appropriate example of it.	**07**
		OR	
	(b)	What do you mean by metal matrix composite material? Write the applications and example of metal matrix composite material.	**07**
Q.3	**(a)**	List the criteria for selecting the type of casting process.	**07**
	(b)	Describe the working principle of X-ray diffraction method, kind of information it gives.	**07**
		OR	
Q.3	**(a)**	Write design guidelines, which supports to "progressive solidification" and "reduce the chance of heat concentration" with suitable examples for casting.	**07**
	(b)	List the kind of information yield by optical microscopy and the scanning electron microscopy studies.	**07**
Q.4	**(a)**	What are the factors to be taken into consideration for proper design of brazed joints? Through sketch show the good practice for butt brazed joint to improve the stress distribution.	**07**
	(b)	Write the considerations for forging that are to be produced in horizontal forging machines.	**07**
		OR	
Q.4	**(a)**	Write the general design guidelines for weldments.	**07**
	(b)	Explain with sketch the important of parting line for design consideration in forging.	**07**
Q.5	**(a)**	Give the guideline with suitable example for each to reduce material consumption in press working.	**07**
	(b)	Describe the design considerations for extruded parts of plastics	**07**
		OR	
Q.5	**(a)**	What do you mean by formability of metal sheet? Describe through which it can identify.	**07**
	(b)	Explain the galvanic corrosion and design recommendations to reduce this type of corrosion.	**07**

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