Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1720808 **Date: 23-06-2014**

Subject Name: Manufacturing Processes and Analysis

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)**	Give the complete analysis of metal drawing process.	**10**
	(b)	Define flow curve and prove that ů = R Ů	**04**
Q.2	**(a)**	Discuss the effects of temperature, strain rate and friction on metal forming process.	**06**
	(b)	A washer with a 12.7 mm internal hole and an outside diameter of 25.4 mm is to be made from 1.5 mm thick strip of 0.2 percent carbon steel. Considering the elastic recovery of the material, find: i) the clearance, ii) blankind die-opening size, iii) the blanking punch size, iv) the piercing punch size, v) the piercing die-opening size.	**08**
		OR	
	(b)	A cup 105 mm inside diameter and 90 mm deep is to be drawn from steel sheet 1 mm thick. Determine the blank diameter and a suitable punch diameter for the first draw. Give the probable dimensions of the cup obtained from the first draw and estimate the press capacity.	**08**
Q.3	**(a)**	Discuss the casting design for a permanent mould casting method.	**06**
	(b)	With the help of diagrams, discuss the shell moulding method.	**08**
		OR	
Q.3	**(a)**	Name the products manufactured by Vacuum casting methods.	**06**
	(b)	Discuss precision investment casting.	**08**
Q.4	**(a)**	Explain the causes of the development of residual stresses in welded structures.	**06**
	(b)	Two steel plates each 1 mm thick are spot welded at a current of 5000A. The current flow time is 0.1 s. The electrodes used are 5 mm in diameter. Determine the heat generated and its distribution in the weld zone. The effective resistance in the operation is 200µÝ.	**08**
		OR	
Q.4	**(a)**	List the practical ways of controlling distortion. Describe any two.	**06**
	(b)	Sketch a set-up of hot machining process by induction heating. What are the chief advantages of employing this method of heating over furnace heating?	**08**
Q.5	**(a)**	Discuss the effects of following parameters on working accuracy and rate of metal removal in AJM: I) Grain size II) Jet velocity III) Jet pressure IV) Standoff distance.	**06**
	(b)	Describe the RP technology called Three Dimensional Printing.	**08**
		OR	
Q.5	**(a)**	Discuss the effect of various process parameters which affect the MRR in USM.	**06**
	(b)	Write the basic principles of RP. What are the three types of starting materials in RP?	**08**

****