Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 712801N Date: 08-01-2013

Subject Name: Advance Casting Technology

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)**	Describe the major activities in Metal Casting through a flow chart and compare the merits and demerits of Metal Casting process with other mfg. process.	**07**
	(b)	Give the classification of foundry sands. Describe the properties and characteristics of silica sand and zircon sand.	**07**
Q.2	**(a)**	Explain in detail, the requirements of good moulding sand.	**07**
	(b)	What are the binders? Explain the bonding action of clay in green sand.	**07**
		OR	
	(b)	Describe the defects that caused by improper pattern equipments, wrong practices in molding and core making.	**07**
Q.3	**(a)**	Enlist the various types of pattern and compare any three patterns (giving neat sketches) by their construction, application and limitations.	**07**
	(b)	What are the activities in "pattern design"? Illustrate with examples, various pattern allowances normally given.	**07**
		OR	
Q.3	**(a)**	With a neat sketch, give the principle of operation, merits-demerits and applications of pressure die casting process.	**07**
	(b)	With a neat sketch, give the principle of operation, merits-demerits and applications of centrifugal casting process.	**07**
Q.4	**(a)**	Explain the phenomena of directional solidification and how it is achieved by chills and padding.	**07**
	(b)	Differentiate between dendrite, nucleus and crystal grain. Suggest methods to get uniform grain size in a casting having thick and thin sections.	**07**
		OR	
Q.4	**(a)**	Sketch the components of gating system. What are the functions of good gating system? Explain the casting defects attributable to poor gating design?	**07**
Q.4	**(b)**	Explain the principles of fluid flow involved in the design of sprue, runner and gating deriving the expressions.	**07**
Q.5	**(a)**	State the basic requirements for effective function of a riser. State and explain any three commonly used methods for calculating riser size.	**07**
	(b)	State the important considerations while designing a component to be manufactured by casting process with example.	**07**
		OR	
Q.5	**(a)**	Explain the description, causes and prevention of the following casting defects: (i) Scab expansion (ii) Cross-joint (iii) Flash (iv) Hot tears (v) Pinholes (vi) Swell/Mould burst	**07**
	(b)	Explain the principles of ultrasonic testing of casting. Compare radiography with ultrasonic testing for the internal soundness of castings.	**07**

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