	Seat N	No.: Enrolment No GUJARAT TECHNOLOGICAL UNIVERSITY M. E SEMESTER – I • EXAMINATION – WINTER 2012	
	_	ect code: 712801N Date: 08-01-2013 ect Name: Advance Casting Technology	
		e: 02.30 pm – 05.00 pm Total Marks: 70	
	Inst	 Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q.1	(a)(b)	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. Give the classification of foundry sands. Describe the properties and characteristics of silica sand and zircon sand.	07 07
Q.2	(a) (b)	Explain in detail, the requirements of good moulding sand. What are the binders? Explain the bonding action of clay in green sand. OR	07 07
	(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. OR	07
Q.3	(a)		07
	(b)		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. OR	07
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 07 commonly used methods for calculating riser size.

(b) State the important considerations while designing a component to be manufactured by casting process with example.

OR

Q.5 (a) Explain the description, causes and prevention of the following casting defects: (i) Scab 07 expansion (ii) Cross-joint (iii) Flash (iv) Hot tears (v) Pinholes (vi) Swell/Mould burst

(b) Explain the principles of ultrasonic testing of casting. Compare radiography with 07 ultrasonic testing for the internal soundness of castings.
