## **GUJARAT TECHNOLOGICAL UNIVERSITY** ME – SEMESTER-1 (NEW) EXAMINATION – WINTER 2016

Sub	ject	Code: 2712801 Date:04/01/2017	
Sub Tin	oject ne: 2	Name: Advance Casting TechnologyTotal Marks: 70:30 pm to 5:00 pmTotal Marks: 70	
msu	<b>1.</b> 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Compare the merits and demerits of	07
	(b)	(1) Metal casting Vs Metal forming and (11) Metal casting Vs Welding Explain in detail, the requirements of good moulding sand.	07
Q.2	(a) (b)	What are the binders? Explain the bonding action of clay in green sand. Write the tests and procedures to find the following properties of molding and core sands: (1) Green compressive strength (2) Permeability (3) Moisture content.	07 07
	(b)	"The quality requirements of core sand are much more stringent than that of molding sand" – Justify with proper reasons.	07
Q.3	(a)	With a neat sketch, give the principle of operation, advantages-limitations and	07
	(b)	applications of pressure die casting process. Differentiate between dendrite, nucleus and crystal grain. Suggest methods to get uniform grain size in a casting having thick and thin sections.	07
Q.3	(a)	With a neat sketch, give the principle of operation, advantages-limitations and applications of shell moulding process.	07
	(b)	List and discuss the factors that affect the fluidity of metals.	07
Q.4	(a) (b)	Explain the solidification phenomena that affect casting soundness. Discuss (i) External Chill (ii) Internal Chill. "The use of internal chill is more suitable than external one". Explain.	07 07
<b>0</b> 4	(2)	OR The metal contracts in volume as it cool in the mould. Discuss the stages in which	07
Q. <b>T</b>	(u)	the contraction of the metal takes place.	07
	(b)	Describe the important considerations and design steps of gating system for steel casting.	07
Q.5	(a)	Give the classification of casting defects. Explain the causes and remedies of surface defects and dimensional defects	07
	(b)	Explain through sketches the techniques of radiographic testing of casting, using X-rays and $\gamma$ -rays.	07
Q.5	(a)	State the important considerations while designing a component to be manufactured	07
-	(b)	by casting process with example. Explain the principles of ultrasonic testing of casting. Compare radiography with ultrasonic testing for the internal soundness of castings.	07