Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (OLD) EXAMINATION – WINTER 2017

Subject Code:132101 Date:29/11/2017

Subject Name: Elements of Metallurgy and Material Science

Time: 10:30 AM to 01:00 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 a brief Classification of engineering materials and explain Engineering requirements of materials	**03 +04**
	(b)	Give the Criteria for selection of materials for engineering applications	**07**
Q.2	**(a)**	What do you mean by deformation? Differentiate in Elastic and Plastic Deformation.	**03 +04**
	(b)	Discuss structure, property & Application relationship in Engineering Materials with suitable example	**07**
		OR	
	(b)	What is imperfection? Discuss different crystals imperfections in metallic material in brief	**02 +05**
Q.3	**(a)**	Define and explain: (1) Creep (2) Resilience (3) Hardness	**02+03+02**
	(b)	Define metallurgy. Describe Various fields of metallurgy	**07**
		OR	
Q.3	**(a)**	What is composite? Explain comparison between metal matrix and ceramic matrix composite.	**07**
	(b)	What is a foundry? List the advantages of casting process over other fabrication processes. Draw a flow chart showing major foundry activities	**03+ 04**
Q.4	**(a)**	What are polymers? Discuss the different Polymerization mechanisms with sketch	**07**
	(b)	Write a short note on Piezoelectric materials	**07**

OR

Q.4	**(a)**	List various types of Corrosion? Explain the Principle and Suggest various methods to prevent it.	**04+03**
	(b)	Differentiate between cold working and hot working	**07**
Q.5	**(a)**	What is difference between Destructive &Non-destructive testing? Explain Magnetic Particle Inspection Technique.	**07**
	(b)	What are the ceramic materials? Write short note on Traditional ceramic and Modern ceramic materials.	**07**

OR

Q.5	**(a)**	What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy.	**03 +04**
	(b)	Explain the Principle difference between welding, Brazing and soldering	**07**