

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code:3162110

Date:22-05-2025

Subject Name:Materials Processing

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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Why a study of metallurgy is necessary to understand metal working & metal joining process?	03
	(b) List out the Bulk metal forming and sheet metal forming processes.	04
	(c) Suggest basic differences between Hot worked and cold worked structure and properties of materials.	07
Q.2	(a) How to determine the yield point of some very ductile metals that do not exhibit clear yield point? Suggest method using example.	03
	(b) Differentiate between slab, billets and bloom and draw diagram of the primary metal products produced out of them.	04
	(c) How does rolling differ from forging in metal forming? Draw schematics of types of rolling mill set up.	07
	OR	
	(c) Discuss the changes in grain structure during rolling and process of dynamic recovery and recrystallisation.	07
Q.3	(a) What are the typical applications of deep drawing in industries such as automotive and appliance manufacturing?	03
	(b) Critically compare the microstructure and mechanical properties of cast & forged material.	04
	(c) Describe the difference between open-die forging and closed-die forging and list out the automobile industry products manufactured by forging process.	07
	OR	
Q.3	(a) Suggest extrusion die material and their required properties.	03
	(b) What are the typical applications of wire drawing in manufacturing and industries?	04
	(c) Explain with neat schematic the differences between direct extrusion and indirect extrusion and impact extrusion process.	07
Q.4	(a) Discuss the Basic Principle of Arc Welding Processes and list down various Processes covered under it.	03
	(b) What is the importance of carbon equivalent calculations in welding of carbon and low alloys steels? Write C.E. formula.	04
	(c) Compare the basic principle of working of Shielded Metal Arc Welding and Gas Metal Arc welding Process.	07

OR

- Q.4** (a) State the basic difference between MIG and MAG Process. **03**
(b) State the difference between Hot cracking and cold cracking with suitable examples. **04**
(c) List out the factors to be considered while joining two dissimilar metals for example carbon steel with Stainless Steel. **07**

- Q.5** (a) Differentiate between cast alloys and wrought alloys with example of each. **03**
(b) Draw a flow diagram of any metal casting process. **04**
(c) Discuss the role of mould, core, pattern, runner, riser and chill in metal casting process. **07**

OR

- Q.5** (a) What is ceramic material and state important properties of it. **03**
(b) Discuss the solidification process of the castings and the micro structure produced. **04**
(c) Discuss the role of network modifiers, network formers and Network intermediates in Glass structure. **07**
