

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER- III(NEW) EXAMINATION – WINTER 2022****Subject Code:3132107****Date:27-02-2023****Subject Name:Introduction to Materials Engineering****Time:02:30 PM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
<b>Q.1</b> (a) How metallurgy differs from material science.?	<b>03</b>
(b) What do you mean by technological properties? List the properties and explain any two in detail	<b>04</b>
(c) What are the criteria to be consider for selection of an engineering materials for given applications Explain in detail.	<b>07</b>
<b>Q.2</b> (a) Define malleability, ductility, creep	<b>03</b>
(b) Draw the stress - strain diagram.for ductile material	<b>04</b>
(c) Calculate the atomic radius of Simple cubic FCC and BCC structure.	<b>07</b>
<b>OR</b>	
(c) Classify the engineering materials and state its basic properties.	<b>07</b>
<b>Q.3</b> (a) Suggest combination of properties required for the following objects 1. Gears 2. TMT bars 3. Gold ornaments 4. Copper wire for electrical cable	<b>03</b>
(b) The metals differs from the ceramics. Justify the statement.	<b>04</b>
(c) Write short note on Extrusion	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Draw the schematic figure of Types of rolling mill process.	<b>03</b>
(b) Differentiate the edge dislocation and screw dislocation	<b>04</b>
(c) What do you mean by imperfection in crystals? Explain briefly the different types of crystal imperfections	<b>07</b>
<b>Q.4</b> (a) Write different steps of investigation of material failure.	<b>03</b>
(b) What is casting? State advantages and disadvantages of foundry technology.	<b>04</b>
(c) Select the material for making “Kitchen Knife” justify the selection of material in context of properties requirement. according to application	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Being human of 21 <sup>st</sup> century it is difficult to survive without metals/materials. Justify the statement.	<b>03</b>
(b) List the advantages and limitation of powder metallurgy.	<b>04</b>
(c) State the role of metallurgy Engineer in industries. List out various metallurgical industries in India.	<b>07</b>
<b>Q.5</b> (a) Differentiate between soldering and brazing.	<b>03</b>
(b) Draw the different welding joints.	<b>04</b>
(c) What is welding? Explain MMAW in detail.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) List the characteristics of Brittle failure in metal alloys.	<b>03</b>
(b) Write sequential; steps of sand casting technique for casting production.	<b>04</b>
(c) Write short note on deep drawing operation.	<b>07</b>