

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3162115****Date:10-07-2023****Subject Name:Advanced Materials****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) “Stainless steels have good corrosion resistance”. Justify	03
	(b) Write short note on Ausformed steel.	04
	(c) Compare Austenitic SS and Martensitic SS with composition, properties and applications and microstructure.	07
Q.2	(a) List out characteristics of High strength low alloy steel(HSLA).	03
	(b) Give composition and properties of one Tungsten base & one Molybdenum based tool steel.	04
	(c) Discuss Hadfield Manganese steel with composition, Properties and Application and heat treatment with microstructure.	07
OR		
Q.3	(a) Write a short note on : Bio-materials.	07
	(a) Which are characteristics of free cutting steel? Why free cutting steel contain high sulphur?	03
	(b) Compare composition , properties and applications of Silal and Nicrosilal.	04
(c) Describe metallurgical aspects of Titanium and alloys. Discuss their applications in aircraft industry.	07	
OR		
Q.3	(a) Enlist properties and applications of Mg alloys.	03
	(b) Explain brief about Ni -hard cast iron.	04
	(c) Describe the critical property and applications of Ni base super alloys. Explain any one Ni base super alloy in detail.	07
Q.4	(a) Discuss Glass transition temperature in Metallic glasses	03
	(b) Define Smart Material. Why does piezo electric is called a smart Material?	04
	(c) Explain Maraging steel and Dual phase steel in brief.	07
OR		
Q.4	(a) What is Nano Technology? What are Nano materials?	03
	(b) Give basic properties and applications of Iron base and cobalt base super alloys	04
	(c) Write a short note on: carbon Nano-tubes	07
Q.5	(a) Discuss Aerospace materials with its composition, properties and applications.	03
	(b) What are surface composites? Give basic properties and applications of Surface composites.	04
	(c) Write a short note on : Shape memory material	07
OR		
Q.5	(a) Explain TRIP steel in brief.	03
	(b) Differentiate Semi conducting and Superconducting materials with its composition, properties and applications.	04
	(c) Write short note on Cryogenic materials.	07

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