

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:3172119****Date:16-12-2024****Subject Name: Alloy Steel****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) Define the name stainless steel. What are the constituents are important in stainless steel?	03
	(b) Classify the carbon steel.	04
	(c) What is an alloy? What is the role of the alloying element in the alloys? Based on the alloying elements, classify alloy steels.	07
Q.2	(a) Explain the orange peel effect in low carbon steel.	03
	(b) For making plough, and JCB bucket teeth, which steel is appropriate? Discuss.	04
	(c) For making steel free cutting, which ingredients are added? What are the structural changes occur because of addition of them? Discuss.	07
	OR	
	(c) Designate the steel as per AISI, SAE standard.	07
Q.3	(a) What is the composition of spring steel?	03
	(b) What are the phases of dual phase steel?	04
	(c) Write a short note on precipitation hardened steel.	07
	OR	
Q.3	(a) List the problems related to stainless steel.	03
	(b) What is the difference in the heat treatment of maraging steel and ausforming steel?	04
	(c) Discuss the compositions, TTT/CCT curves and strengthening mechanism of ausforming steel.	07
Q.4	(a) List the AISI grade of ferritic stainless steel.	03
	(b) Which stainless steel is used to make medical equipment? Discuss.	04
	(c) Discuss austenitic stainless steel grades. How 3XX and 2XX stainless steels differ?	07
	OR	
Q.4	(a) What is the full form of HSLA? How the strengthening to be achieved in it?	03
	(b) How to designate tool steel?	04
	(c) Discuss the inherent impurities in the steel. How the impurities affect the further processing of steel?	07
Q.5	(a) What are the selection criteria for the tool steel?	03
	(b) Compare and contrast cold and hot work tool steel.	04
	(c) Write a short note on HSS.	07
	OR	
Q.5	(a) List the martensitic stainless steel grades.	03
	(b) With the help of microstructure, show phases, and composition of ball bearing steel.	04
	(c) Write a short note on water hardened tool steel.	07
