

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3172115

Date:28-11-2025

Subject Name:Surface Engineering

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) Explain the need for engineered surfaces in materials and manufacturing.	03
	(b) What is surface preparation? What is the significance of it ?	04
	(c) Compare sand blasting, shot blasting, and hydro-blasting in terms of process and application	07
Q.2	(a) Name types of surface coatings for corrosion resistance	03
	(b) Describe the vapor phase degreasing process with the help of a schematic diagram.	04
	(c) Compare metallic and glass coatings in terms of application areas and durability.	07
<b>OR</b>		
	(c) Critically compare flame hardening and induction hardening in terms of methodology and applications.	07
Q.3	(a) Silver ornaments have become black. Which surface treatment process do you suggest to turn them shiny	03
	(b) Describe the basic principles of Carburizing and Nitriding surface hardening methods.	04
	(c) Explain the process of Boronizing with a schematic representation of the reaction involved.	07
<b>OR</b>		
Q.3	(a) State the requirements of surface engineering in Food, Dairy and pharma industries.	03
	(b) Discuss the applications of tinning in the food packaging industry.	04
	(c) Compare galvanizing and anodizing in terms of surface finish and corrosion resistance.	07
Q.4	(a) What is the difference between plating & coating ?	03
	(b) What is the principle behind electrolytic plating? How does it differ from electroless plating?	04
	(c) Briefly describe the phosphating process and its industrial applications.	07
<b>OR</b>		
Q.4	(a) What is passivation of Stainless Steel?	03
	(b) Write a short note on anodizing and its importance in aluminum surface treatment.	04
	(c) What are the key advantages of friction stir processing for surface modification?	07
Q.5	(a) State the applications of PVD in tool manufacturing	03
	(b) Write short note on Plasma Vapor deposition (PVD) technique.	04

- (c) Describe the principle of thermal spray coating and its importance in engineering surfaces. **07**

**OR**

- Q.5** (a) List out the various defects encountered in Coatings. **03**

- (b) What are the different types of spray guns used in thermal spray coating? **04**

- (c) Suggest the type of surface engineering on the following products and justify with reason. **07**

1. SS dairy equipment 2. Excavator bucket 2. Decorative Ash Tray 3. automobile Gears 4.Plumbing fittings 5. Aluminium textile boobin 6. I.C engine Cylinder liners 7. Car door handle.

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