

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019****Subject Code: 2172107****Date: 26/11/2019****Subject Name: Surface Coating Technology****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.

		MARKS
<b>Q.1</b>	(a) State the requirements of the coating by giving examples of suitable application.	<b>03</b>
	(b) Describe the following methods: <ol style="list-style-type: none"> <li>1) Shot blasting and</li> <li>2) Hydro-blasting.</li> </ol>	<b>04</b>
	(c) Explain the scope and importance of surface engineering for different engineering materials.	<b>07</b>
<b>Q.2</b>	(a) Explain the importance of surface preparation.	<b>03</b>
	(b) Discuss the steps of chromating process with neat sketch.	<b>04</b>
	(c) Explain the process of phosphating on carbon steel. Discuss the mechanical and chemical properties developed on surface and its application in industries.	<b>07</b>
	<b>OR</b>	
	(c) Explain Anodizing as a method of corrosion prevention along with the essential process parameters. Discuss the role of oxide film in Aluminium anodizing.	<b>07</b>
<b>Q.3</b>	(a) State principle of Electro-less Plating along with the applications for the same.	<b>03</b>
	(b) Explain various factors affecting Electrodeposition.	<b>04</b>
	(c) Define Galvanizing. Draw a process layout of Hot dip Galvanizing of carbon steel sheets.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain Sputtering using schematic.	<b>03</b>
	(b) Explain use of ion beam implantation in surface modification.	<b>04</b>
	(c) What is Physical Vapour Deposition (PVD)? Discuss evaporation method of PVD.	<b>07</b>
<b>Q.4</b>	(a) Define pickling. State purpose of pickling and give name of pickling chemicals.	<b>03</b>
	(b) What is passivation? Why is it required for stainless steels?	<b>04</b>
	(c) What are surface metal matrix composites? Explain friction stir processing method to manufacture the same.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) List examples of components made using thermal spray coatings.	<b>03</b>

- (b) Explain the advantages offered by surface metal matrix composites over metal matrix composites. **04**
- (c) Discuss about different spray guns that can be used in thermal spray coating. Explain effect of spray gun on coating structure and properties. **07**
- Q.5** (a) Suggest type of surface treatment needed for removing Tarnishing on Silver ornaments. **03**
- (b) Critically compare Pack Carburizing and Liquid Carburizing. **04**
- (c) Describe carbonitriding process in detail. List the components that are subjected to the same. **07**
- OR**
- Q.5** (a) Discuss Plasma Spray Coating process with neat schematic. **03**
- (b) Compare the Chromizing and Aluminizing diffusion coating methods. **04**
- (c) Discuss a case study for surface coating/modification for designing gear assembly (made of low alloy steel with 0.15% C, 1% Cr, 0.5% Si and 1% Mn) in the car. Suggest a technique, explain and justify the same. **07**

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