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**ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)****B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR / MAY 2024****MECHANICAL ENGINEERING**Semester **VII****ML5701 - SURFACE ENGINEERING**

(Regulation 2019)

Time: 3hrs

Max. Marks: 100

CO1	To educate Important of Surface Engineering in Industries
CO2	To provide knowledge on Thermal Spray For Coating
CO3	To import knowledge on the Process and Mechanism Of Different Diffusion Coating Process
CO4	To provide knowledge on the Methods Of Non Metallic Coating
CO5	To import knowledge on the Testing Procedure For Quality Assurance.

**BL – Bloom's Taxonomy Levels**

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

**PART- A(10x2=20Marks)**

(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Classify the types of corrosion.	2	1	1
2	Define Pilling Bedworth ratio.	2	1	2
3	What is flade potential?	2	2	2
4	Define exchange current density.	2	2	1
5	What are the different types of corrosion in the automobile industry?	2	3	2
6	What are the corrosion issues in chemical processing industry?	2	3	1
7	List the ASTM standards for corrosion testing.	2	4	2
8	What is accelerated weathering test?	2	4	2
9	What chemicals are used to inhibit corrosion?	2	5	1
10	Define sputter coating and write its use.	2	5	2

**PART- B(5x 13=65Marks)**

Q.No.	Questions	Marks	CO	BL
11 (a)	Explain in detail about the Pourbaix diagram for Iron and magnesium.	13	1	3
OR				
11 (b)	Explain the different types of wear encountered in engineering application.	13	1	3
12 (a)	Discuss the different types of polarization with neat sketch.	13	2	4
OR				
12 (b)	What is Tafel analysis for corrosion? Explain in detail with neat sketches.	13	2	4

13 (a)	(i) Explain the galvanic corrosion in detail (ii) Describe the mechanism of fretting corrosion.	13	3	4
OR				
13 (b)	(i) Explain the methods of evaluating corrosion failures (ii) Discuss high temperature corrosion in detail	13	3	4
14 (a)	Elaborate about stress corrosion test and salt spray test.	13	4	3
OR				
14 (b)	Explain in detail about susceptibility tests for intergranular corrosion.	13	4	3
15 (a)	Discuss the various types of corrosion prevention methods.	13	5	4
OR				
15 (b)	Briefly explain the following (i) HVOF coating (ii) PVD process	13	5	4

**PART- C(1x 15=15Marks)**  
(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	With a case study elaborate about Hydrogen Embrittlement along with its Causes, Effects and Prevention.	15	1	5

