



4/12/24, F.W

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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

Materials Science and Engineering
VII Semester
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-Appling, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)

(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Differentiate between Adhesive and Abrasive wear.	2	1	2
2	What is meant by Pilling Bedworth Ratio?	2	1	2
3	What does a Tafel plot tell you?	2	2	2
4	What is meant by passivity in a metal?	2	2	2
5	How do you prevent hydrogen embrittlement in steel?	2	3	2
6	What is boiler corrosion due to dissolved oxygen reaction?	2	3	2
7	What is meant by salt spray testing method?	2	4	2
8	List some of the ASTM Standards For Corrosion Testing.	2	4	2
9	What is meant by corrosion inhibitor?	2	5	2
10	Write the principle of electroless plating?	2	5	2

PART- B(5x 13=65Marks)

(Restrict to a maximum of 2 subdivisions)

Q.No.	Questions	Marks	CO	BL
11 (a)	Classify the different types of wear and explain with a suitable example.	13	1	2
OR				
11 (b)	What is the Pourbaix diagram? Draw the pourbaix diagram for any metal and discuss its salient features.	13	1	2
12 (a)	Explain the mechanism of corrosion based on the electrochemical principle and discuss the factors that will affect the corrosion rate.	13	2	3
OR				
12 (b)	What is meant by passive metal? Explain the passive behavior of aluminum in detail.	13	2	3

13 (a)	Explain the effect of corrosion in chemical processing industries (case study) and discuss its exposing environment and the methods to prevent it.	13	3	2
OR				
13 (b)	Explain the effect of corrosion in petroleum industries (case study) and discuss its exposing environment and the methods to prevent it.	13	3	2
14 (a)	What is the causes and effect of intergranular corrosion in austenitic stainless steel? Explain the oxalic acid screening test procedure and control methods to prevent the intergranular corrosion.	13	4	3
OR				
14 (b)	What is meant by stress corrosion cracking (SCC)? Explain the factors influencing the SCC and discuss the prevention methods.	13	4	3
15 (a)	Explain the principle of anodic and cathodic protection method to prevent the corrosion.	13	5	3
OR				
15 (b)	Explain the principle and construction of chemical vapour deposition process with neat sketch.	13	5	3

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

Q.No.	Questions	Marks	CO	BL
16.	List the various forms of corrosion. Explain the galvanic form of corrosion with a suitable example and its prevention methods.	15	<u>1</u>	5

