Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026

Sixth Semester

Mechanical Engineering

CME397 SURFACE ENGINEERING

Regulations - 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A(ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	State the laws of friction.	L1	1	2
2.	How is rolling friction different from sliding friction?	L3	1	2
3.	List any two wear mechanisms.	L4	2	2
4.	What is wear debris analysis?	L2	2	2
5.	List two factors influencing corrosion.	L2	3	2
6.	Evaluate the effectiveness of material selection in corrosion prevention.	L5	3	2
7.	Compare PVD and CVD in terms of application.	L2	4	2
8.	Propose a coating method for wear resistance in aerospace components	L6	4	2
9.	Name the two superalloys.	L1	5	2
10.	Suggest which polymers suitable for tribological applications.	L6	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Explain surface features and roughness parameters with suitable diagrams. How are they measured?	L4	1	8
		ii	Analyze the influence of material properties and environmental factors on frictional behavior.	L4	1	8
			Or			
	b		Explain an experimental setup to study the stick-slip phenomenon in sliding contacts.	L2	1	16
12.	a	i	Describe the process of wear debris analysis and explain its role in predictive maintenance.	L3	2	16
			Or			
	b	i	Analyze theoretical wear models and compare them with practical wear behavior in metals.	L4	2	16
13.	a	i	Describe different types of corrosion with suitable examples and diagrams.	L2	3	16
			Or			
	b	i	Propose a corrosion prevention strategy for underground pipelines considering environmental factors.	L6	3	16
14.	a	i	Discuss the properties of hydrophilic, hydrophobic, and superhydrophobic surfaces and their applications.	L2	4	16
			Or			
	b	i	Explain the performance of DLC, CNC, and nano-engineered coatings in extreme environments.	L2	4	16
15.	a	i	Explain the mechanical and chemical properties that make titanium alloys suitable for biomedical applications.	L2	5	8
		ii	Explain how ceramic materials are applied in tribological systems and justify their usage.	L3	5	8

Or

b	i	Discuss a polymer-based composite material for a low-friction, wear-resistant application.	L2	5	8
	ii	Critically evaluate the suitability of nickel-based alloys for high-temperature chemical processing environments.	L5	5	8

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