

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025****Third Semester****Mechanical Engineering****UMET24302- Engineering Metallurgy****Regulations - 2024***Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	What is an alloy?	L1	1	2
2.	State Hume Rothery's rules.	L1	1	2
3.	Low carbon steel in the normalized condition is stronger than the same steel in the annealed condition why?	L2	2	2
4.	What are some selective heating techniques employed for surface hardening?	L1	2	2
5.	Compare the martensite that is formed in maraging steels with the martensite that is formed in carbon steels.	L2	3	2
6.	Write the composition of 18/4/1 type high speed steels.	L1	3	2
7.	Differentiate commodity plastics with engineering plastics.	L2	4	2
8.	Name any four thermoplastics and thermosetting plastics.	L1	4	2
9.	Define stiffness.	L1	5	2
10.	List any four technological properties of metal.	L1	5	2

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

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Discuss the similarities and differences between substitutional and interstitial solid solution.	L2	1	16
	Or			
	b Draw iron -carbide equilibrium diagram & mark on it all salient temperature and composition fields. And explain about its phases and invariant reactions.	L2	1	16
12.	a Draw the schematic isothermal transformation diagram corresponding to 0.8% of carbon steel and explain its constructing procedure.	L3	2	16
	Or			
	b Define hardenability of steel. Explain the experiment with jominy end quench test used to determine hardenability of steel. How will you draw hardenability curves this sheet?	L3	2	16

13.	a	Write short notes on: i. Austenitic stainless steel ii. Ferritic stainless steel iii. Martensitic stainless steel	L2	3	16
		Or			
	b	Discuss step involved in precipitation hardening treatment with any one aluminum alloy as example	L2	3	16
14.	a	Describe the molecular structure, properties and application of the following polymeric materials: i. Poly methyl methacrylate (PMMA) ii. Poly tetra fluoro ethylene (PTFE) iii. Polyethylene terephthalate (PET) iv. Acrylonitrile butadiene styrene	L2	4	16
		Or			
	b	Describe the properties and application of the following ceramics materials: i. Alumina ii. Silicon carbide iii. Silicon nitride iv. Sialon.	L2	4	16
15.	a	Compare and contrast the Brinell, Vickers and Rockwell hardness tests.	L2	5	16
		Or			
	b	Describe the procedure of Charpy and Izod impact testing and the properties obtained from it.	L2	5	16