CBCS SCHEME

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BAU302

Third Semester B.E./B.Tech. Degree Examination, June/July 2025
Material Science and Metallurgy

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Classify engineering materials based on composition.	10	L1	CO1
	b.	Derive (APF) atomic packing factor expression for face centered cubic structure.	10	L3	CO2
		OR			
Q.2	a.	Explain the elastic properties of mild steel using stress strain curve.	10	L1	CO1
	b.	State and explain Fick's laws of diffusion.	10	L3	CO2
		Module – 2			
Q.3	a.	Define fracture. Explain the stages of ductile fracture.	10	L2	CO2
	b.	With the sketch, explain creep mechanism.	10	L3	CO3
		OR			
Q.4	a.	Define fatigue. Brief about its types.	10	L4	CO2
	b.	Give the significance of S-N curve with example.	10	L2	CO3
		Module – 3			
Q.5	a.	Explain in brief about types of batteries.	10	L2	CO3
	b.	Brief on various materials used in batteries.	10	L4	CO3
		OR			
Q.6	a.	Give brief note on battery safety and fuel cells.	10	L3	CO3
	b.	Brief about the fundamentals of electrochemical supercapcitors.	10	L2	CO3
		Module – 4			
Q.7	a.	Explain the significance of heat treatment with its types.	10	L3	CO2
	b.	Explain annealing and its types.	10	L4	CO3
		OR			
Q.8	a.	Brief about the process of carburizing.	10	L2	CO2
	b.	Enumerate the properties, composition of gray cast iron.	10	L1	CO3
		Module – 5			
Q.9	a.	Give a brief note on aluminium and its alloys.	10	L1	CO3
	b.	Brief about the composition, properties and applications of Aℓ – Si alloys.	10	L2	CO2
		OR			
Q.10	a.	Sketch and explain hand – layup method involved for fabrication of PMC's.	10	L3	CO3
	b.	Make brief note on applications of polymer and metal matrix composites in automobile applications.	10	L4	CO4

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