CBCS SCHEME

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BAU302

Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.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.	Define the following terms : i) Unit cell ii) Space lattice iii) Coordination number iv) Atomic packing factor.	10	L1	CO1
	b.	Derive an expression for APF for Body centered cubic structure.	10	L3	CO1
		OR			
Q.2	a.	Outline the stress strain curve for mild steel.	10	L3	CO1
	b.	List and explain the various crystal defects.	10	L2	CO1
		Module – 2			
Q.3	a.	Discuss about the stresses induced in 2D plane and give an expression for each type of stress.	10	L3	CO2
	b.	Briefly explain Mohr' circle for plane stress.	10	L2	CO2
		OR			
Q.4	a.	Differentiate between ductile and brittle fracture.	10	L3	CO2
	b.	Describe the various stages of ductile fracture with neat sketch.	10	L3	CO2
		Module – 3			
Q.5	a.	List and explain the various materials used in batteries.	10	L2	CO3
	b.	Discuss in brief about different types of batteries.	10	L3	CO3
		OR			
Q.6	a.	Give note on primary and secondary cells.	10	L3	CO3
	b.	Explain the fundamental of electrochemical super capacitors.	10	L2	CO3
		Module – 4			
Q.7	a.	Give the significance of heat treatment in metal and list the various heat treatment processes.	10	L3	CO4
	b.	Explain annealing and its types.	10	L2	CO4

		OR			
Q.8	**a.**	What is the purpose of surface hardening? Explain any surface hardening method with the help of sketch.	**10**	**L1**	**CO4**
	b.	Explain the process of carburizing.	**10**	**L1**	**CO4**
		Module – 5			
Q.9	**a.**	Categorize copper alloys and list any 4 advantages and applications.	**10**	**L3**	**CO5**
	b.	Give the composition, properties and application of AL-Si alloys.	**10**	**L3**	**CO5**
		OR			
Q.10	**a.**	Define a composite classify composites based on reinforcement and material matrix used.	**10**	**L2**	**CO5**
	b.	Elaborate the application of polymer based composite in Automobile sector.	**10**	**L3**	**CO5**

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