

# CBCS SCHEME

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BAU302

## Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024 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 material science. Classify materials based on composition.	10	L1	CO1
	b.	Derive an expression for atomic packing factor for body centered cubic crystal structure.	10	L3	CO1
OR					
Q.2	a.	State and explain Fick's laws of diffusion.	10	L2	CO1
	b.	Sketch and explain stress-strain curve for mild steel.	10	L3	CO1
Module - 2					
Q.3	a.	Define fracture. Explain the stages of ductile fracture.	10	L1	CO2
	b.	With the sketch, explain the phenomenon of creep.	10	L3	CO1
OR					
Q.4	a.	Enumerate the meaning of fatigue. Explain its types.	10	L2	CO2
	b.	Explain the significance of S-N curve.	10	L2	CO2
Module - 3					
Q.5	a.	List and explain the various materials used in Batteries.	10	L4	CO4
	b.	Discuss in brief about different types of batteries.	10	L2	CO4
OR					
Q.6	a.	Explain the fundamentals of electrochemical super capacitors.	10	L4	CO4
	b.	Give a short note on: i) Battery safety ii) Fuel cells.	10	L2	CO4
Module - 4					
Q.7	a.	Define heat treatment. List the various types of heat treatment.	10	L2	CO3
	b.	Explain annealing and its types.	10	L3	CO3
OR					
Q.8	a.	Explain the process of carburizing.	10	L2	CO3
	b.	Elaborate the properties, composition of gray cast iron.	10	L3	CO3

## Module – 5

Q.9	a.	Explain in brief about cu-alloys.	10	L2	CO3
	b.	Give the composition, properties and applications of Al-Si alloys.	10	L4	CO3
OR					
Q.10	a.	Sketch and explain spray-lay up method for fabricating composites.	10	L3	CO1
	b.	Elaborate the applications of polymer based composites in automobile sector.	10	L4	CO3

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