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USN:

BAU302

Visvesvaraya Technological University

Model Question Paper-I with effect from 2022-23(CBCS Scheme)

Third Semester B.E. Degree Examination

Material Science and Metallurgy

TIME:03

Hours

Max.Marks:100

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each Module.

Q.No	Module-1	Marks	CO	BTL
1.a	Define the following terms. i)Unit cell, ii) Space lattice, iii) Co-ordination number, iv) APF	08	CO1	L1
b	State and Explain Ficks laws of diffusion	08	CO1	L3
c	Give a note on aggregates	04	CO2	L1
	OR			
2.a	Derive an expression for APF for Face Centered cubic structure	10	CO1	L3
b	Define stress and Strain. Draw the stress- strain curve for Mild steel and explain the various properties	12	CO2	L2
	Module-2			
3.a	Define Fracture and explain the stages of fracture	12	CO3	L2
b	Differentiate b/w ductile and brittle fracture	08	CO2	L2
	OR			
4.a	With the help of S-N curve, explain fatigue fracture in materials	08	CO3	L3
b	Explain the creep phenomena with the sketch	12	CO2	L4
	Module-3			
5.a	Explain the types of Batteries in detail	08	CO3	L1
b	List and explain the materials used in batteries	12	CO2	L3
	OR			
6.a	Explain the fundamentals of electrochemical super capacitors	10	CO2	L3
b	Brief on Fuel cells and Battery safety	10	CO3	L2
	Module-4			
7.a	List the various heat treatment process of steels and explain any one	10	CO4	L3
b	Classify annealing process of heat treatment and explain any two	10	CO3	L4
	OR			
8.a	Explain the process of carburizing and cyaniding in detail	10	CO3	L3
b	Give the properties, Composition and uses of Gray cast iron	10	CO4	L2
	Module-5			
9.a	Explain in brief about copper-based alloys	10	CO3	L4
b	Define composite and classify composites in brief based on reinforcement and matrix	10	CO4	L2
	OR			
10.a	Give the production methods of developing PMC's & Explain any one	12	CO3	L4
b	Enumerate the benefits and applications of composites	08	CO4	L2

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USN:

BAU302

Visvesvaraya Technological University

Model Question Paper-II with effect from 2022-23(CBCS Scheme)

Third Semester B.E. Degree Examination

Material Science and Metallurgy

TIME:03

Hours

Max.Marks:100

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each Module.

Q. No	Module-1	Marks	CO	BTL
1.a	Define material science. Classify engineering materials based on chemical composition	08	CO1	L1
b	Differentiate b/w crystalline and amorphous solids	08	CO1	L3
c	Derive an expression for APF for simple cubic structure	04	CO2	L1
	OR			
2.a	Define the following terms: i) Elastic strength ii) stiffness modulus iii) Yield strength iv) Ultimate strength, v) Tangent modulus	10	CO1	L3
b	Discuss the factors affecting diffusion	10	CO2	L2
	Module-2			
3.a	Define fatigue in materials and explain the help of S-N curve explain the fatigue strength	10	CO3	L2
b	Give the phenomenon of creep in detail with sketch	10	CO2	L2
	OR			
4.a	With neat sketch explain the stages of ductile fracture	08	CO3	L3
b	Give any 4 differences between ductile and brittle fracture	12	CO2	L4
	Module-3			
5.a	Explain the various materials used in batteries	08	CO3	L1
b	Give the fundamentals of electrochemical super capacitors	12	CO2	L3
	OR			
6.a	Discuss about Fuel cells and Battery safety	10	CO2	L3
b	Give the types of Batteries in detail	10	CO3	L2
	Module-4			
7.a	Explain the process of heat treatment in metals and list the types	10	CO4	L3
b	List surface hardening methods and explain any one	10	CO3	L4
	OR			
8.a	Explain the process of induction hardening in detail	10	CO3	L3
b	Give the properties, Composition and uses of malleable iron	10	CO4	L2
	Module-5			
9.a	Brief about Aluminium -based alloys	10	CO3	L4
b	Define composite. List the benefits and limitations of composites	10	CO4	L2
	OR			
10.a	Explain any one production method of developing MMC's	12	CO3	L4
b	Enumerate the applications of composites in automobile industry	08	CO4	L2

