

G. S. Mandal's
 Maharashtra Institute of Technology, Aurangabad
 (An Autonomous Institute)
 END SEMESTER EXAMINATION
First Year M.Tech (ME) -April/May 2022

Course Code : MTM103

Course Name : Adv. In Materials

Duration : 2 Hrs

Max. Marks : 50

Date : 09/04/2022

Instructions :

- i) All questions are compulsory
 ii) Assume suitable data wherever necessary and clearly state it
 iii) Figures to the right indicate full marks

Q. 1	Solve/Answer Any Five (Marks: 10)					
	Questions	Marks	CO	BL	PO	PI
a)	Draw the schematic diagram of scanning electron microscope.	2	1	1	1	
b)	Write two applications of transmission electron microscope.	2	1	1	1	
c)	Write two advantages of auger electron microscope.	2	1	1	1	
d)	State two chemical analysis techniques in materials.	2	1	2	1	
e)	What is buckyball structure?	2	1	2	1	
Q. 2	What are magnetic separation techniques? Write the different factors used in selection of magnetic separation equipment.	8	5	3	1	
Q. 3	A continuous and aligned glass fiber-reinforced composite consists of 30 vol% of glass fibers having a modulus of elasticity of 76 GPa and 70 vol% of a polyester resin that, when hardened, displays a modulus of 2.8 GPa. (a) Compute the modulus of elasticity of this composite in the longitudinal direction. (b) If the cross-sectional area is 275 mm ² and a stress of 40 MPa is applied in this longitudinal direction, compute the magnitude of the load carried by each of the fiber and matrix phases.	8	3	5	1	
Q. 4	Explain the three main stages observed in liquid phase sintering.	8	2	3	1	
Q. 5	Explain in details thermo-gravimetric analysis (TGA). Write limitations and applications of TGA.	8	4	4	1	
OR						
Q. 5	Explain in details about potentiostat with neat sketch diagram.	8	4	4	1	
Q. 6	What is absorption kinetics? Explain in details about pseudo first order absorption model.	8	6	4	1	
OR						
Q. 6	What is graphene oxide (GO)? Write the synthesis, structure, and applications of graphene oxide.	8	6	4	1	