Question Paper

Exam Date & Time: 02-Feb-2023 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES END SEMESTER THEORY EXAMINATION - DECEMBER 2022 III SEMESTER B.Sc. (Applied Sciences) in Engg.

MATERIAL SCIENCE AND ENGINEERING [IMET 233]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data may be suitably assumed.

1)	A)	Define line defects. Draw the neat sketches of edge and screw dislocations along with Burgers circuit.	(3)
	B)	Show for a simple cubic structure, the free space in unit cell is 48%.	(3)
	C)	Represent the following miller indices in cubic crystal structure: (110), [120], $[\overline{3} \ 1 \ 2]$, (1 0 $\overline{2}$)	(4)
2)		Define nucleation. Explain heterogeneous nucleation.	(3)
	A)		
	B)	Explain the phenomenon of crystal growth during solidification.	(3)
	C)	Name and explain various types of interstitial and substitutional solid solutions.	(4)
3)	A)	Construct the phase diagram for the solidus and liquidus temperatures of the Germanium-Silicon system. Estimate the amount solid and liquid phases 50% Si alloy at 1300 ⁰ C and their compositions.	(5)