



**B.Tech III Semester Supplementary Examinations, July 2022**  
**Metallurgy & Material Science**  
(Mechanical Engineering)

**Maximum Marks: 70**

**Date: 27.07.2022 Duration: 3 hours**

Part-A

All the following questions carry equal marks		(10x2M=20 Marks)
1	What is the necessity of Alloying?	2
2	Find the packing efficiency in BCC lattice.	2
3	What do you mean by Isomorphous system?	2
4	Write a note on eutectic and eutectoid	2
5	Differentiate between annealing and normalizing.	2
6	Write any two non ferrous metals	2
7	What are the effects of non-equilibrium cooling of alloys?	2
8	Write the composition of Naval brass.	2
9	Define ceramic and composite.	2
10	Differentiate between crystallize ceramics and cermet's.	2

Part-B

Answer All the following questions.		(10M X 5=50Marks)
11	a) Write about crystallization of meals. b) What is the role of grain size on the properties of materials?	10
OR		
12	Determination of grain size by any two methods.	10
13	Apply the Lever rule to phase equilibrium in an alloy of 15% B and 85% A when a liquid of 45% B is in equilibrium with a solid solution of 95% A.	10
OR		
14	Draw and explain the phase diagram where two components are completely soluble in both liquid and solid state with suitable examples.	10
15	Explain Iron- Iron Carbide diagram with neat sketch.	10
OR		
16	Draw the TTT diagrams and explain the different cooling rates.	10
17	a) Draw the partial Al-Cu phase diagram (up to 10% Cu) and explain engineering significance of Al with 4-5% Cu. b) Explain how the property of aluminum alloys changes on hardening.	10
OR		
18	Explain Grey cast iron with equilibrium diagram and mechanical properties?	10
19	Write the classification, properties, applications and advantages and disadvantages of composite materials?	10
OR		
20	Write Short notes on: a) Metal ceramic mixtures.                      b) Nano Materials.	10