PAPER ID-310901

Roll No: | | | | | | | | | | | | | |

B TECH
(SEM-III) THEORY EXAMINATION 2020-21
MATERIAL SCIENCE

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Q no.	Question	Marks	CO
a.	Define solid solution.	2	K2
b.	What is phase in metals?	2	K2
c.	Write the types of cast iron?	2	K2
d.	What is the purpose of tempering?	2	K2
e.	What is plastic deformation?	2	K2
f.	Define twinning.	2	K2
g.	Define the concept of magnetism.	2	K2
h.	Write is Superconductivity?	2	K2
i.	What is matrix and reinforcement?	2	K2
j.	What are metallic glasses?	2	K2

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

Q no.	Question	Marks	CO
a.	State the Hume-Rothery rules that favour extensive solid solubility.	10	K2
b.	Draw the Iron-carbon equilibrium diagram and explain the features.	10	K2
c.	What are some of the typical characteristics of ceramic materials?	10	K2
d.	Define superconductivity. Explain Type II superconductor is detail and application of Type II superconductor in detail	10	K2
e.	Explain the various properties and applications of carbon nano tubes.	10	K2

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	Marks	CO
a.	i. What is Equilibrium? State its importance and objectives. ii. State Gibbs Phase rule. State its importance in detail.	10	K2
b.	Explain in detail the different phases in a eutectic phase diagram with their micro structural changes on cooling.	10	K2

4. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	Marks	CO
a.	What is TTT Diagram? Explain briefly with neat sketch stating its importance.	10	K2
b.	State and explain Fick's First and Second Law.	10	K2

5. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	Marks	CO
a.	What is specimen preparation? Explain the steps involved in specimen preparation.	10	K2
b.	What is creep? Draw a typical creep curve and explain the different stages of creep.	10	K2

6. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	Marks	CO
a.	What are dielectric materials? Enumerate the applications of dielectrics.	10	K2
b.	Explain the following: (i) Ferromagnetism, (ii). Diamagnetism.	10	K2

7. Attempt any *one* part of the following: 10 x 1 = 10

Qno.	Question	Marks	CO
a.	State the potential application of Nanomaterials.	10	K2
b.	Explain shape memory alloys & its application.	10	K2