PAPER ID-310036

Subject Code: NCH022

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

B.TECH
(SEM VII) THEORY EXAMINATION 2020-21
MATERIAL TECHNOLOGY

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

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

SECTION A

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

a.	Define point imperfections.
b.	Differentiate between the plain carbon steel and tool steel.
c.	Define unit cell and space lattice.
d.	What is Hysteresis loop?
e.	Explain atomic mass and atomic number.
f.	Define nanomaterials.
g.	Explain Visco-elastic deformation.
h.	
i.	What do you mean by Polymorphism ?
j.	Differentiate between annealing and tempering.

SECTION B

2. Attempt any *three* of the following: 10x3=30

a.	What are the limitations of plain carbon steel.Explain the effect of alloys on phase transformation?
b.	Describe how normalizing heat treatment of 0.3% carbon steel be carried out and what will its properties be after this normalizing heat treatment?
c.	Differentiate between toughness and hardness in detail.
d.	What is Atomic packing factor? Calculate the atomic packing factor for copper.
e.	Explain the term corrosion and discuss its types and mechanism and write also five methods of prevention and control.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a.	Discuss manufacturing of Wrought Iron and discuss about its properties and application.
b.	Describe the various mechanical properties that are needed in biomaterials used for different applications. How are these properties tested?

4. Attempt any *one* part of the following: 10x1=10

a.	What are the advantages of induction hardening over flame hardening? Discuss when these surface hardening treatments are needed to be performed.
b.	Define critical cooling rate.Describe various cooling curves on TTT diagram.What factors affects critical cooloing rate.

5. Attempt any *one* part of the following: 10x1=10

a.	What are the factors affecting the selection of materials for constructional purpose in chemical industries?
b.	Name some methods by which refractory materials can be coated on alloys. How do these coating affect their properties and what are the application areas of such coating?

6. Attempt any *one* part of the following: 10x1=10

a.	How creep test is carried out?Explain Andrade's analysis of creep.
b.	Define corrosion.Explain different types of corrosion and methods of prevention of material from corrosion.

7. Attempt any *one* part of the following: 10x1=10

a.	Define 'Alloy'.Name different types of alloys.Discuss Hume-Rothery Conditions of formation of solid solution.
b.	Describe the various mechanical properties that are needed in biomaterials used for different applications. How are these properties tested?