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MATS201 Enrol. No. A2305220118

[ST]

END SEMESTER EXAMINATION : APRIL-MAY 2022

MATERIAL SCIENCE

Time : 2 Hrs. *Maximum Marks : 60*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (24 Marks)

Attempt any **four** *questions out of* **five**.
Each question carries **06** *marks.*

1. With the help of neat diagrams explain the seven crystal structure system.

2. Define the term "Atomic Packing Factor". Derive the value of Atomic Packing Factor for Body Centered Cubic Structure.

3. Define the term "hardness". Discuss the different types of hardness testing methods.

4. With the help of neat diagrams, explain the terms ductility and toughness.

P.T.O.

5. Draw and Explain Stress-Strain plot for (a) Mild Steel and (b) Cast Iron.

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three**.
Each question carries **10** *marks.*

6. Discuss the different types of "Steels" along with their industrial applications.

7. What do you mean by the term "Heat Treatment"? Discuss the various purposes illustrating why the heat treatment is being performed on metals.

8. Describe the "Free Electron Theory" for metals. What are the shortcomings of this model?

SECTION – C (16 Marks)

(Compulsory)

9. (a) Discuss the importance of various materials. (4)

(b) Differentiate between "Malleability" and "Resilience". (4)

(c) Draw the Iron-Carbon equilibrium diagram indicating the various structures formed along with the temperature zones as well. (4)

(d) Differentiate between N-Type and P-Type semiconductors. Draw the energy band diagram of both N and P-type materials showing the position of donor, acceptor and Fermi energy levels respectively. (4)