

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2023**(2020 SCHEME)****Course Code : 20MET285****Course Name: Material Science and Technology****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. Explain the covalent bond with an example.
2. Find out atomic packing factor of the FCC crystals.
3. Describe slip systems.
4. Explain the steps for finding miller indices of planes.
5. State Hume Rothery's rules.
6. Give an example for failure due to DBTT of Steel.
7. Differentiate between CFRP and GFRP.
8. Define ferroelectric materials with an example.
9. What do you know about doping in semiconductors?
10. Explain about Superconductivity.

PART B***(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. a) Explain the ionic, covalent, and metallic bonds' properties. (10)
- b) Explain why ice floats on water. (4)

OR

12. Derive the atomic packing factor for BCC and FCC crystal structures. (14)

MODULE II

13. Explain the different modes of plastic deformation (14)

OR

14. Describe Fick's laws of diffusion. (14)

MODULE III

15. What are the factors affecting fatigue strength? Explain each factor

in detail. (14)

OR

16. What is Creep? How creep is evaluated? (14)

MODULE IV

17. What are the classifications of composites? Give an example each. (14)

OR

18. Write a note on electronic band structures and explain how the electrical conductivity can be estimated. (14)

MODULE V

19. Illustrate step by step process of fabrication of integrated circuits. (14)

OR

20. a) Distinguish between intrinsic and extrinsic semiconductors, (7)
b) Write a short note on diodes, transistor, and photon detectors. (7)
