

QP CODE: 26019149



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc PHYSICS (MATERIAL SCIENCE)

ELECTIVE - PH840403 - MATERIALS SCIENCE AND ENGINEERING

2019 Admission Onwards

8B552E94

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What are biomaterials?
2. Define bonding energy.
3. What is meant by edge dislocation?
4. What do you mean by grain size?
5. What are thermosetting polymers? Give example.
6. Explain briefly why the tendency of a polymer to crystallize decreases with increasing molecular weight.
7. Briefly explain the relation between true strain and engineering strain.
8. Define design stress.
9. What is the principal difference between wrought and cast alloys?
10. What are super alloys?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain why covalently bonded materials are generally less dense than ionically or metallically bonded ones.





12. Discuss the impurities, which are found in ceramics.
13. Name and describe the two atomic mechanisms of diffusion.
14. Briefly explain the characteristics of hydrocarbon molecules.
15. Describe linear polymer and branched polymers with suitable example.
16. Describe in detail (a) compression test (b) torsional test.
17. Give the distinctive features, limitations, and applications of the following ceramic materials:
Glasses, Clay products and Refractories.
18. Describe the composition, manufacturing and properties of Cements.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Give a detailed description about Van der waals bonding.
20. Discuss point defects in metals and point defects in ceramics.
21. Describe the mechanical behaviour of ceramics, also explain the influence of porosity on the mechanical properties of ceramics.
22. What are Polymers? Briefly explain its different types.

(2×5=10 weightage)

