



22100921

QP CODE: 22100921

Reg No :

Name :

**B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,
APRIL 2022**

Sixth Semester

Choice Based Core Course - PH6CBT02 - MATERIAL SCIENCE

Common for B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

035120DA

Time: 3 Hours

Max. Marks : 80

Part A

Answer any **ten** questions.

Each question carries **2** marks.

1. How does the response of a material varies with the imposed conditions?
2. What is meant by thermal conductivity of materials?
3. What are 3 dimensional defects?
4. Why the heat capacity increases with temperature?
5. What is the influence of temperature for the pure metal?
6. What is the basic principle of photovoltaic effect?
7. What do you mean by passive liquid crystals?
8. What is nematic liquid crystal?
9. What is the application of metallic glasses?
10. Define a nanoparticle.
11. How does an Alkali doped C60 molecule forms?
12. What is Raman scattering of light?

(10×2=20)

Part B

Answer any **six** questions.

Each question carries **5** marks.



13. Discuss on different types of advance materials.
14. How do the mechanical properties of solids influence its ability to withstand stress?
15. Discuss on different tensile properties of solids.
16. What are the differences between dielectric strength and dielectric constant?
17. What is meant by photoconductivity and what are the factors that influence photoconductivity?
18. What are the general features of liquid crystals?
19. Describe how colour centres are generated in solids?
20. Discuss the size effects and behaviour of conduction electrons in quantum nanostructures.
21. Describe the principle and operational modes of Atomic Force microscope.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **15** marks.

22. Describe different types of imperfections in solids.
23. What are the diffusion mechanisms of solid? Describe Fick's first and second laws of diffusion.
24. Describe photoelectric effect in detail. Calculate the number of photons from green light of mercury ($\lambda=4960\text{\AA}$) required to do one joule of work.
25. Discuss the following in detail (a) the optical absorption spectrum of semiconducting nanoparticles (b) molecular clusters and rare gas nanoparticles.

(2×15=30)