21101101

QP CODE: 21101101

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) EXAMINATION, APRIL 2021

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

F4E5C17D

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What are the different components of smart materials?
2. What do you mean by microstructure and macrostructure?
3. What are the different mechanisms of heat conduction in solids?
4. Differentiate between conduction in metals and semiconductors.
5. What do you mean by dielectric strength?
6. What do you meant by exciton absorption?
7. What is the expression for photoconductivity of solids in dark?
8. What is meant by photoluminescence?
9. What are R centres and M centres in solids?
10. What are magic numbers?
11. Define Coulombic explosion
12. What are the salient features of linear carbon clusters?

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. What are the classifications of physical properties based on the nature of relationship between physical quantities?

14. Discuss different types of point defects?

15. Explain the stress-strain behaviour of materials.

16. Discuss on different tensile properties of solids.

17. Distinguish between cholesteric liquid crystals and smectic liquid crystals.

18. Explain how a numerical display is created using LCD.

19. What is the binding energy in eV of electrons in magnesium, if the longest-wavelength photon that can eject electrons is 337 nm?

20. Explain 0D,1D, and 2D nanomaterials.

21. Discuss the principle and theory of X-Ray diffraction also explainthe Xray diffraction analysis

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Discuss on bulk and interfacial defects in crystals.

23. What are the diffusion mechanisms of solid? Describe Fick's first and second laws of diffusion.

24. What is the principle behind the display devices? Differentiate between active and passive liquid crystals.

25. Describe the principle and working of Transmission electron microscope with suitable diagram.

(2×15=30)