

Bachelor's Degree Examination – November 2017

V Semester

Class : III UG
Major : Physics

Time : 3 Hours
Max. Marks : 100

15BPHC14 Material Science

Part – A

10 x 1 = 10

Choose the Correct Answer

1. A covalent bond is also called as
a. molecular bond b. atomic bond
c. ion bond d. line
2. A hydrogen bond is
a. magnetic force of attraction
b. the electrostatic attraction between two polar groups
c. electro magnetic force of attraction
d. molecular force of attraction
3. Vacancies, interstitials, substitutional are --- defects
a. Zero dimensional b. two dimensional
c. three dimensional d. four dimensional
4. Dislocations are
a. areas where the atoms are out of position
b. atoms are in their respective position
c. molecules are displaced d. embedded ions are moving
5. A single crystal is
a. with no grain boundaries b. with large defects
c. without atoms d. with ions only
6. A state of a solution that contains more of the dissolved material is called
a. super saturation b. super cooling
c. super vapour d. dilution
7. A process whereby particles are ejected from a solid target material due to bombardment of the target by energetic particles is called
a. emission b. Bombardment
c. ejection d. sputtering
8. A technique that uses a direct electric current (DC) to drive an otherwise non-spontaneous chemical reaction is called
a. Electrolysis b. chemical displacement
c. optical synthesis d. photo synthesis
9. Ultrasonic pulse-wave frequencies range from
a. 0.1-50 MHz b. 1-10KHz
c. 100MHz d. 200GHz
10. NDT stands for
a. non dimensional testing b. non destructive temperature
c. no due testing d. non destructive testing.

Part – B

5 x 6 = 30

Answer the following

Answer should not exceed 400 words or two pages

- 11.a. List the properties of ionic solids
(Or)
- 11.b. List the properties of covalent solids
- 12.a. With suitable example explain about BCC, FCC crystal structure
(Or)
- 12.b. With neat sketches show vacancy defect and interstitial defect in crystals
- 13.a. Define crystal. Explain the significance of a single crystal.
(Or)
- 13.b. Define and discuss about solubility, super solubility and super saturation
- 14.a. What is a thin film? Discuss the kinetic theory of gas and emission condition
(Or)
- 14.b. Write short notes on electrolysis plating.
- 15.a. Explain about radiographic testing method with a suitable diagram
(Or)
- 15.b. Assess the role of any two equipments used in NDT testing

Part – C

5 x 12 = 60

Answer the following

Answer should not exceed 800 words or four pages

- 16.a. Compare and Contrast Vanderwaal's and Hydrogen bonding
(Or)
- 16.b. Write short notes on bond length and binding energy of a crystal
- 17.a. Elaborate about Frenkel and Scottky defect.
(Or)
- 17.b. Explain about screw and edge dislocation and surface imperfections.
- 18.a. Deduce Gibbs Thomson equation for vapour and solution
(Or)
- 18.b. Compare homogeneous and heterogeneous nucleation
- 19.a. Enumerate i. electron beam method ii. Deposition by chemical reaction
(Or)
- 19.b. Explain about i. cathodic sputtering ii. Chemical vapour deposition
- 20.a. Describe ultrasonic and thermal methods of NDT.
(Or)
- 20.b. Discuss about i. surface defect by NDT. ii. Visual methods
