

**Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University) Coimbatore-641 043
Bachelor's Degree Examination – November-2018
V Semester**

**Class : III UG
Major : Physics**

**Time :3 hours
Max. Marks: 100**

15BPHC14 Materials Science

Part-A

10 x 1=10

Choose the correct answer

1. Which of the following elements is a covalently bonded crystal?
a. aluminium b. sodium chloride c. germanium d. lead
2. Among the following bonds which is stronger bond?
a. ionic bond b. metallic bond c. dispersion bond d. hydrogen bond
3. Dislocations are
a. line defects b. planar defects c. chemical defects d. point defects
4. The crystal structure of silver is
a. FCC b. BCC c. HCP d. None
5. ----- is an important phenomenon in crystal growth.
a. crystal b. nucleation c. solid d. liquid
6. The spontaneous formation of crystalline nucleus in the interior of the parent phase is called
a. heterogeneous nucleation b. nucleation
c. homogeneous nucleation d. solubility
7. Give the thickness range of the film used in thin film technology
a. 0.5 – 2.5 mils b. 0.02 – 8 mils c. 10 – 20 mils d. 0.05 – 0.07 mils
8. How is the process of film deposition carried out in cathode sputtering?
a. slower than evaporation method b. faster than evaporation method
c. similar to same as evaporation method d. all of the above
9. Non destructive testing means the ----- of a material.
a. testing b. inspection c. both a & b d. property
10. Which of the following is under mechanical property?
a. tensile strength b. compressive strength c. hardness d. all the above

Part B

5 X 6=30

Answer the following

Answer should not exceed 400 words or two pages

11.a. Distinguish between ionic and covalent bonding in crystals.

(or)

11.b. Explain about molecular bond.

12.a. What is meant by crystal imperfections? Give its classifications.

(or)

12.b. Write the properties of screw dislocation.

13.a. Give the significance of single crystals.

(or)

13.b. Discuss in detail about solubility & super solubility.

14.a. Discuss briefly about kinetic theory of gas.

(or)

14.b. Give an explanations on chemical displacement.

15. a. Explain visual methods of NDT.

(or)

15. b. Describe surface defect detection by NDT.

Part C

5 x 12=60

Answer the following

Answer should not exceed 800 words or four pages

16. a. Explain in detail about binding energy of a crystal.

(or)

16. b. Explain the following terms: i) Vander Waals bonding. ii) Bond strength.

17. a. Give a account on geometry of dislocations.

(or)

17. b. Give a detailed account on surface imperfections.

18. a. Describe the homogeneous nucleation.

(or)

18. b. What is meant by super saturation? Derive an expression for super saturation.

19. a. Discuss in detail about CVD.

(or)

19. b. With necessary theory, explain the concept of distribution of deposit.

20. a. Discuss briefly about radiographic method.

(or)

20. b. Explain in detail, equipments used in NDT.
