

Home Assignment

Subject: Physics (Major)

B.Sc 6th Semester (Both Regular and Arrear)

Paper: 602

Mathematical Methods & Solid State Physics

Read the Instructions carefully before submission

1. The Assignment contains 20 numbers of Multiple Choice Questions (MCQs), each having one correct answer. Out of 20 you have to attempt only 11 numbers of questions.
2. Please take your time and read each question carefully, because once you submit it you can't modify the answers.
3. Students are directed to Send the scan copy of the assignment to the email id: chakravartyrimpi07@gmail.com mentioning their Name, Roll Code and Roll No., Registration No.
4. Last date of submission is 08/08/2020

Total Marks = 11

1. A^{ij} and B_{ij} are –
 - (a) Covariant and Contravariant tensor respectively
 - (b) Contravariant and Covariant tensor respectively
 - (c) Mixed tensors
 - (d) None of the above
2. T_{lm}^{ijk} is a tensor of rank –
 - (a) 5
 - (b) 3
 - (c) 4
 - (d) 2
3. The result of the inner product of A_k^{ij} and B_{mnt}^k is –
 - (a) C_{kmnt}^{ijk}
 - (b) C_{ijk}^{kmnt}
 - (c) C_{mnt}^{ij}
 - (d) None of the above
4. The number of lattice point in a primitive cell is –
 - (a) 1
 - (b) 1/2
 - (c) 2
 - (d) 3/2
5. The coordination number in the case of simple cubic crystal system is –

- (a) 12
 - (b) 6
 - (c) 2
 - (d) 1
6. The number of atoms present in the unit cell of hcp structure is –
- (a) 2
 - (b) 6
 - (c) 4
 - (d) 7
7. The packing factor of the fcc structure is –
- (a) 52%
 - (b) 68%
 - (c) 74%
 - (d) None of the above
8. The packing factor of diamond cubic crystal system is –
- (a) 60%
 - (b) 34%
 - (c) 56%
 - (d) 90%
9. The number of molecules present in the unit cell of NaCl is –
- (a) 2
 - (b) 5
 - (c) 4
 - (d) None of the above
10. The Miller indices of the plane parallel to the x and y-axes are –
- (a) (1 0 0)
 - (b) (0 1 0)
 - (c) (1 1 1)
 - (d) (0 0 1)
11. If (h k l) are the Miller indices of a plane, then the plane cuts the axes into h, k and l equal segments –
- (a) Yes
 - (b) No
12. If (3 2 6) are the Miller indices of a plane, the intercepts made by the plane on the three crystallographic axes are –
- (a) (2a, 3b, c)
 - (b) (a, b, c)
 - (c) (a, 2b, 3c)
 - (d) None of the above
13. In a single crystal lattice is five-fold rotation axis of symmetry possible or not?
- (a) Yes
 - (b) No
14. If axial length of an unit cell is $a \neq b \neq c$ and interaxial angle is $\alpha = \beta = \gamma = 90^\circ$, the crystal system is –

- (a) Monoclinic
 - (b) Triclinic
 - (c) Hexagonal
 - (d) Orthorhombic
15. Madelung constant relates to the strength of bonding energy in –
- (a) Van Der Waals solids
 - (b) Hydrogen bonded solids
 - (c) Ionic solids
 - (d) Covalent Solids
16. The nature of binding for a crystal with alternate and evenly spaced positive and negative ion is –
- (a) Ionic
 - (b) Covalent
 - (c) Metallic
 - (d) Dipole
17. What is the nature of bonding in **CH₄**?
- (a) Covalent
 - (b) Ionic
 - (c) Dispersion
 - (d) Metallic
18. The length of H-H bond is –
- (a) 0.074 nm
 - (b) 0.01 nm
 - (c) 0.037 nm
 - (d) 2 nm
19. X-ray consists of-
- (a) Negatively charged particles
 - (b) Positively charged particles
 - (c) A stream of neutrons
 - (d) Electromagnetic Radiation
20. The variation of intensity of X-rays with the thickness of an absorbing material is given by –
- (a) $I = I_0 \exp(-\mu x)$
 - (b) $I = I_0 \exp(\mu x)$
 - (c) $I = I_0 \exp(-\mu/x)$
 - (d) $I = I_0 \exp(\mu/x)$
