

Dayanand Science College, Latur

Department of Physics

Model Question Paper (MCQ for Practice)

Paper Name: Solid State Physics

Paper No.: XIII-A

SEM-V

1. How many types of translation vectors?
 - A. Zero
 - B. One
 - C. Three
 - D. Two**

2. The effective number of lattice points in a primitive unit cell is
 - A. One**
 - B. Two
 - C. Zero
 - D. Four

3. The inversion operation symmetry is applicable only to
 - A. Zero dimension
 - B. One dimension
 - C. Two dimension
 - D. Three dimension**

4. The symbol 'I' represents
 - A. Primitive cells
 - B. Body centered cells**
 - C. Face centred cells
 - D. None of these

5. A crystal with unit cell parameters $a=b=c$ and $\alpha=\beta=\gamma=90^\circ$ belong to

- A. **Cubic system**
B. Monoclinic system
C. Triclinic system
D. Hexagonal system
6. Coordinate number for closed packed crystal structure.....
- A. 4
B. 0
C. 2
D. 12
7. The atomic radius in case of face centred cubic cell is.....
- A. a
B. $\frac{\sqrt{2} a}{4}$
C. $\frac{\sqrt{3} a}{4}$
D. $\frac{a}{4}$
8. In the BCC structure, the packing fraction is
- A. 0.068
B. 0.68
C. 6.8
D. None of these
9. The metal 'Zn' exhibits..... type of structure.
- A. bcc
B. fcc
C. hcp
D. None of these
10. Sodium is an example ofsystem.
- A. hcp

- B. **bcc**
- C. fcc
- D. None of these
11. The intensity of reflected lines increases with increase in the value of
- A. Integer (n)
- B. θ
- C. **Both (A) an (B)**
- D. None of these
12. A crystal acts as a.....dimensional grating for X-ray of wave length of the order of atomic diameter.
- A. **Three**
- B. One
- C. Two
- D. Zero
13. NaCl is an example of
- A. Metallic bond
- B. Covalent bond
- C. **Ionic bond**
- D. None of these
14. A metallic bond is formed due to the
- A. **Partially shearing of valence electron**
- B. Shearing of valence electron
- C. Transfer of electron
- D. All of the above
15. In crystal structure of Si we have.....
- A. **Covalent bond**
- B. Ionic bond

- C. Metallic bond
- D. None of these
16. X-rays have larger wavelength than
- A. Beta rays
- B. Gamma rays**
- C. Microwave rays
- D. Visible light
17. The repulsive force is also known as.... forces
- A. Short range**
- B. Long range
- C. Both (A) and (B)
- D. None of these
18. The energy of X-rays depends upon the.....
- A. Anode current
- B. Heater current
- C. Acceleration voltage**
- D. None of these
19. The Bragg angle theta is fixed in
- A. Roentgen diffraction method
- B. Debye-Scherrer's diffraction method
- C. Lau diffraction method**
- D. All of the above
20. In Bragg's equation ($2d\sin\theta = n\lambda$), θ is the angle between;
- A. Specimen surface and incident rays

- B. Normal to specimen surface and incident rays
- C. Normal to parallel lattice surface d distance apart and incident rays
- D. **Parallel lattice surface d distance apart and incident rays**
21. According to the classical theory, the molar heat capacity of all solids is
Temperature
- A. Constant
- B. Dependent
- C. **Independent**
- D. None of these
22. At lower temperature the lattice specific heat varies as.....
- A. T^3
- B. T
- C. $\frac{1}{T^3}$
- D. $\frac{1}{T^2}$
23. In Debye's theory of specific heat of solids, the frequency of vibrations of lattice has...
- A. **A continuous spectrum up to a finite value**
- B. Some discrete value
- C. Fixed value
- D. None of these
24. Einstein's theory concludes that at lower temperature the specific heat.....
- A. Drops linearly with increase of temperature
- B. Drops linearly with decrease of temperature
- C. Remains constant
- D. **Drops exponentially with decrease of temperature**
25. The increases in internal energy is manifested mainly as;
- I. An increase in the vibration of atom about their mean position
- II. An increase in the kinetic energy of free electrons

- A. Only I
B. Only II
C. **Both (I) and (II)**
D. None of these
26. If there are N atoms in a mole of the solid then the total internal energy is.....
- A. $\frac{1}{2} NKT$
B. **$3NKT$**
C. $\frac{5}{2} NKT$
D. $\frac{3}{2} NKT$
27. According to the free electron model, the average kinetic energy of electron at an absolute temperature T is
- A. $\frac{1}{2} kT$
B. $\frac{3}{2} kT$
C. $\frac{2}{3} kT$
D. Zero
28. Identify the very good insulator;
- A. Saw dust
B. Cork
C. Asbestos sheet
D. **Glass wool**
29. At frequencies around $5 \times 10^{14} Hz$, the ionic polarization becomes.....
- A. **Zero**
B. Unity
C. Infinity
D. Negative

30. Which one is correct about Free electron theory:
- A. Semiconductors can be explained properly
 - B. Ohm's law cannot be derived
 - C. A gas of free electrons is responsible for the properties of metal**
 - D. None of these
31. The classical free electron theory is used for.....
- A. To verify Ohm's law
 - B. Explain electrical and thermal conductivities of metals
 - C. Both (A) and (B)**
 - D. None of these
32. The unit electrical conductivity is
- A. Ohm. Meter
 - B. Mho**
 - C. Ohm
 - D. None of these
33. The ratio of drift velocity to the intensity of electric field is called as
- A. Relaxation time
 - B. Mobility**
 - C. Thermal conductivity
 - D. None of these
34. The thermal conductivity is denoted by
- A. Q
 - B. T
 - C. K**
 - D. dT
35. The Lorentz number (L) value is
- A. 2.44×10^{-9}

- B. 24.4×10^{-9}
- C. 0.244×10^{-9}
- D. 2.44×10^{-8}**
36. Which of the following theories cannot be explained by classical theory?
- A. Electron theory
- B. Lorentz theory
- C. Photo-electric effect**
- D. Classical free electron theory
37. Fermi energy is the maximum kinetic energy of a free electron can have at least absolute..... temperature.
- A. Above
- B. Zero**
- C. below
- D. None of these
38. According to free electron theory;
- A. There is no free electron in metal
- B. Valance electron are weakly bound with the atom**
- C. Valance electron are tightly bound with the atom
- D. Some valance electron are weakly bound and some are tightly bound
39. Electrical conductivity of insulator is in the range
- A. $10^{-10}(\Omega\text{-m})^{-1}$
- B. $10^{-10}(\Omega\text{-cm})^{-1}$
- C. $10^{-10}(\Omega\text{-mm})^{-1}$**
- D. None of these
40. The Zone theory was explained by the scientist
- A. Sommerfeld
- B. Bloch**

- C. Durde
- D. None of these