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Physics; Class- B.Sc. SEM IV; Subject-Physics: Paper-I
sample paper

*Required

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BSc Sem IV PHYSICS Papers-I

All Questions Are Compulsory

4. 1. How many unit cells are divided equally in a face-centred cubic lattice? 2 points

Mark only one oval.

- (A) 4
- (B) 6
- (C) 8
- (D) 2
- Option 5

5. 2. A crystalline solid 2 points

Mark only one oval.

- (A) changes abruptly from solid to liquid when heated
- (B) has no definite melting point
- (C) undergoes deformation of its geometry easily
- (D) has irregular 3-dimensional arrangements.

6. 3. What is the possible number of different types of 3 dimensional bravaies lattices 2 points

Mark only one oval.

- (A) 4
- (B) 8
- (C) 14
- (D) 17

7. 4. In a simple cubic, body-centred cubic and face-centred cubic structure, the ratio of the number of atoms present is respectively 2 points

Mark only one oval.

- (A) 8:1:6
- (B) 1:2:4
- (C) 4:2:1
- (D) 4:2:3

8. 5. Which of the following is a crystalline solid? 2 points

Mark only one oval.

- (A) Isotropic substances
- (B) Anisotropic substances
- (C) Supercooled liquids
- (D) Amorphous solids

9. 6. When do ionic compounds conduct electricity? 2 points

Mark only one oval.

- (A) When dissolved in water
- (B) In solid state
- (C) In gaseous state
- (D) They never conduct

10. 7. For the orthorhombic system, axial ratios are $a \neq b \neq c$ and the axial angles are: 2 points

Mark only one oval.

- (A) $\alpha = \beta = \gamma \neq 90$ degree
- (B) $\alpha \neq \beta \neq \gamma \neq 90$ degree
- (C) $\alpha = \beta = \gamma = 90$ degree
- (D) $\alpha \neq \beta \neq \gamma = 90$ degree

11. 8. The three dimensional graph of lattice points which sets the pattern for the whole lattice is called 2 points

Mark only one oval.

- (A) Space lattice
- (B) Simple lattice
- (C) Crystal lattice
- (D) Unit cell

12. 9. If the pressure on a NaCl structure is increased, then its coordination number will 2 points

Mark only one oval.

- (A) Increase
- (B) Decrease
- (C) Either (A) or (B)
- (D) Remain the same

13. 10. Coordination number for crystal is

2 points

Mark only one oval.

- (A) nearest neighboring to each atom in crystal
- (B) opposite atom to each atom in crystal
- (C) diagonal atom to each atom in crystal
- (D) nearest neighboring to each atom in crystal

14. 11. Coordination number for S.C.C. crystal is

2 points

Mark only one oval.

- (A) 12
- (B) 6
- (C) 8
- (D) 2

15. 12. Packing fraction of the crystal is

2 points

Mark only one oval.

- (A) Ratio of actual volume occupied by the spherical atoms to the total available of the structure
- (B) Ratio of actual area occupied by the spherical atoms to the total available of the structure
- (C) Ratio of actual density occupied by the spherical atoms to the total available of the structure
- (D) None of these

16. 13. X rays are basically are

2 points

Mark only one oval.

- (A) Fast moving electrons
- (B) Fast moving positrons
- (C) Fast moving neutrons
- (D) Fast moving protons

17. 14. X rays travel with speed of

2 points

Mark only one oval.

- (A) sound
- (B) light
- (C) both
- (D) None of these

18. 15. X rays ionize the

2 points

Mark only one oval.

- (A) solid
- (B) liquid
- (C) Fluid
- (D) Gas

19. 16. Duane Hunt law is

2 points

Mark only one oval.

- (A) voltage applied to an X-ray tube directly proportional the maximum frequency ν of the X rays emitted from the target.
- (B) voltage applied to an X-ray tube directly proportional the minimum frequency ν of the X rays emitted from the target.
- (C) voltage applied to an X-ray tube directly proportional the maximum wavelength of the X rays emitted from the target.
- (D) none of these

20. 17. Moseley's Law for characteristic X-rays is

2 points

Mark only one oval.

- (A) $\sqrt{\nu} = a(Z-b)$
- (B) $\sqrt{\nu} = aZ$
- (C) $\sqrt{\nu} = aZZ$
- (D) None of these

21. 18. X rays with short wavelength are

2 points

Mark only one oval.

- (A) Soft x rays
- (B) Hard x rays
- (C) above both
- (D) None of these

22. 19. Which rays are used for crystal structure analysis

2 points

Mark only one oval.

- (A) X rays
- (B) visible rays
- (C) UV rays
- (D) None of these

23. 20. Bragg law condition is

2 points

Mark only one oval.

- (A) $2d\sin\theta = n\lambda$
- (B) $d\sin\theta = n\lambda$
- (C) $3d\sin\theta = n\lambda$
- (D) $4d\sin\theta = n\lambda$

24. 21. X-rays are generated by

2 points

Mark only one oval.

- (A) Geiger tube
- (B) Goniometer
- (C) Coolidge tube
- (D) Rotameter

25. 22. Collimators used in XRD are made up of

2 points

Mark only one oval.

- (A) Thin quartz tube
- (B) Thin glass plates
- (C) Thin metal plates
- (D) All of the above

26. 23. Which of the following spectral line is more intense?

2 points

Mark only one oval.

- (A) K_{α}
- (B) K_{β}
- (C) K_{γ}
- (D) K_{δ}

27. 24. The X-rays emitted from an atom when an electron is removed from K- shell are

2 points

Mark only one oval.

- (A) K-lines
- (B) L-lines
- (C) M-lines
- (D) N-lines

28. 25. In X-ray powder camera technique, the detector used is

2 points

Mark only one oval.

- (A) PMT
- (B) Photographic film
- (C) Bolometer
- (D) Thermistor

29. 26. One of the widely used target material for generation of X-ray spectral line is 2 points

Mark only one oval.

- (A) Zinc
- (B) Molybdenum
- (C) Xenon
- (D) Manganese

30. 27. The X-ray diffraction is based upon 2 points

Mark only one oval.

- (A) Illkovic equation
- (B) Bragg's equation
- (C) Boltzmann equation
- (D) Van deemter equationOption 1

31. 28. Which of the following techniques can be considered as finger spectra 2 points

Mark only one oval.

- (A) NMR
- (B) Mass
- (C) X-ray diffraction
- (D) Fluorimetry

32. 29.The plot drawn in x-ray diffraction spectra is 2 points

Mark only one oval.

- (A) Intensity Vs angle
- (B) Intensity vs I
- (C) I vs Angle
- (D) interatomic distance vs angle

33. 30.The detector used in powder diffractometer is 2 points

Mark only one oval.

- (A) Photographic film
- (B) PMT
- (C) Goniometer
- (D) Scintillation counter

34. 31. Reciprocal lattice is 2 points

Mark only one oval.

- (A) A lattice normal to original direct lattice
- (B) A lattice parallel to original direct lattice
- (C) A lattice diagonal to original direct lattice
- (D) i) A lattice orthogonal to original direct lattice

35. 32. Laue method used to rapid determination of 2 points

Mark only one oval.

- (A) Symmetry orientation of single unit cell
- (B) Symmetry orientation of single crystal
- (C) Symmetry orientation of no. of crystals
- (D)None of these

36. 33. Which of the following is a unique property of laser? 2 points

Mark only one oval.

- (A) Directional
- (B) Speed
- (C) Coherence
- (D) Wavelength

37. 34. Which of the following is an example of optical pumping? 2 points

Mark only one oval.

- (A) Ruby laser
- (B) Helium-Neon laser
- (C) Semiconductor laser
- (D) Dye laser

38. 35. Which of the following can be used for the generation of laser pulse? 2 points

Mark only one oval.

- (A) Ruby laser
- (B) Carbon dioxide laser
- (C) Helium neon laser
- (D) Nd- YAG laser

39. 36. What is the need to achieve population inversion? 2 points

Mark only one oval.

- (A) To excite most of the atoms
- (B) To bring most of the atoms to ground state
- (C) To achieve stable condition
- (D) To reduce the time of production of laser

40. 37.DVD uses the laser.

2 points

Mark only one oval.

- (A) True
- (B) False
- (C) both above
- (D) None of these

41. 38.Which of the following is used in atomic clocks?

2 points

Mark only one oval.

- (A)Laser
- (B) Quartz
- (C) Maser
- (D) Helium

42. 39. Which of the following is an example of optical pumping?

2 points

Mark only one oval.

- (A) Ruby laser
- (B) Helium-Neon laser
- (C) Semiconductor laser
- (D) Dye laser

43. 40. Directionality property of laser can be used in

2 points

Mark only one oval.

- (A) surveying
- (B) remote sensing
- (C) lidar
- (D) All Correct

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