

S.B.V.P. Samaj's

Sahakar Maharshi Bhausaheb santuji Thorat College of Arts, science and Commerce. Sangamner.

(422605) .

Class :- F.Y.B.Sc.

Subject :- Physics principles and Applications and Electromagnetics.

Paper :- Phy:-II

By , Prof . V.R.Pande

Select the correct Alternative:-

1.In Bohr second postulate $mrv = \frac{nh}{2\pi}$, n is ----

- a. spin quantum no.
- b. orbital angular quantum no.
- c. principal quantum no.
- d. orbital quantum no.

2. The radius of Bohr orbit is proportional to

- a. n
- b. n^2
- c. n^{-1}
- d. m

3.Nacl is example of

- a. Metallic bond.

- b. ionic bond.
- c. covalent bond.
- d. hydrogen bond

4. The unit of magnetic induction is

- a. $\frac{Wb}{m^2}$
- b. Tesla
- c. Gauss
- d. All

5. State Coulomb is unit of

- a. Charge
- b. dipole moment
- c. Electric intensity.
- d. Potential.

6. The force between the two charges separated by distance r is proportional to

- a. r^3
- b. $r^{-1/3}$
- c. r^{-2}
- d. $r^{1/2}$

7. Electrostatic means study of

- a. Electric charges in motion.
- b. Electric charges at rest.
- c. dynamic current.
- d. none.

8. Dielectric constant is also known as -----

- a. permeability.
- b. relative permeability.
- c. permittivity.
- d. relative permittivity.

9. Volume charge density is -----

- a. one dimensional .
- b. two dimensional .
- c. three dimensional .
- d. dimensionless.

10. The unit of electric field is NOT equivalent to

- a. N/C.
- b. J/C
- c. V/m
- d. J/C m

11. Which of the following is NOT true about electric lines of forces,

- a. never intersect.
- b. parallel to each other , and equally spaced.
- c. pass through conductor, not pass through insulator.
- d. not pass through conductor, but pass through insulator.

12.The work done in bringing the charge from infinity to any point in the field,

- a. electric energy.
- b. electric potential energy.
- c.binding energy.
- d.potential energy.

13.The SI unit of dipole moment is

- a. C m
- b. C² m
- c. C m²
- d. C /m²

14.Which of following charges can form electric dipole ?

- a. +1 μ C and +2 μ C
- b. - 1 μ C and +2 μ C
- c. - 1 μ C and + 1 μ C
- d. -1C and -1C

15. Region surrounding a stationary electric dipole has

- a. Electric field only.
- b. magnetic field only.
- c. both Electric field and. magnetic field
- d. none of above.

16. In Fleming's left rule , the thumb give the direction of -----

- a. current
- b. magnetic field.
- c. motion of conductor.
- d. force acting on conductor.

17. In a conductor, moving electric charges produce -----field.

- a. electric
- b. magnetic.
- c. gravitational
- d. none of these.

18. The Magnetic dipole is a ----- quantity.

- a. scalar
- b. vector.
- c. constant
- d. pseudo vector.

19. χ (Chi. is known as ----

- a. Magnetic induction.
- b. permeability
- c. Magnetic susceptibility.
- d. Magnetic field.

20. Which of the following is NOT electromagnetic waves. ?

- a. water.
- b. U.V.rays
- c. X-ray
- d. Microwaves.

21.The electromagnetic waves are ----- in nature.

- a. longitudinal
- b. stationary.
- C. transverse.
- d. unpolarising.

22.H₂O is ----- molecule .

- a. polar
- b. non-polar.
- c. partially polarised.
- d. none of these.

23. water is ----- substance .

- a. diamagnetic
- b. paramagnetic
- c. ferromagnetic
- d. anti ferromagnetic

24. Which of following are paramagnetic substance ?

- a. Al
- b. Mg
- c. Ca
- d. all .

25. The relation between \vec{E} , \vec{D} and \vec{P} is

- a. $\vec{P} = \vec{E} + \vec{D}$
- b. $\vec{D} = \epsilon_0 \vec{E} + \vec{P}$
- c. $\vec{D} = \epsilon_0 \vec{E} - \vec{P}$
- d. none of these.

26. Which of the following is donor impurity.?

- a. Antimony
- b. Indium
- c. Silicon
- d. none.

27. A diode rectifier converts

- a. A.C. into D.C.
- b. D.C. into A.C.
- c. amplifies A. C. signal.
- d. amplifies D.C. signal.

28. Which of the following is ferromagnetic?

- a. Quartz
- b. Bismuth
- c. Nickel.
- d. Aluminium

29. Most of the substances show which of the following types ?

- a. paramagnetism
- b. diamagnetism
- c. ferromagnetism
- d. None of these.

30. Permeabilities of diamagnetic materials are ,

- a. unity
- b. less than unity
- c. zero
- d. greater than unity.

31. Susceptibility of ferromagnetic substances is

- a. 1
- b. less than 1
- c. zero
- d. greater than 1

32. "On passing current in a conducting wire, the magnetic field, is produced around it" it is the law of

- a. Lenz
- b. Ampere
- c. Ohm
- d. Maxwell

33. Ampere's law is analogous to

- a. Kirchoff's law,
- b. Faraday's law.
- c. Lenz's law.
- d. Gauss theorem in electrostatics.

34. Electric intensity at a place due to charge is ----- quantity.

- a. vector.
- B scalar
- c. unitless
- d. dimensionless.

35 The SI unit of electric flux is

- a. weber.
- b. N/C
- c. Volt meter.
- d. J/C

36. The dielectrics are ----- substances.

- a. conducting
- b. non –conducting
- c. combustible
- d. preservative

37. Which of the following is NOT dielectrics ?

- a. air
- b. glasses
- c. mica
- d. magnesia

38. Dipole moment per unit volume is

- a. electrification
- b. polarisation
- c. magnetisation
- d. none of these.

39 . The SI unit of capacitance of condenser is

a.Henry

b.Ohm

c.Farad

d.Volt.

40.The relation between electric charge, potential and capacity is

a. $C=Q/V$

b. $C=Q+V$

c. $C= Q/V^2$

d. $C= Q^2/V^2$

41.The free electric charge within dielectric is

a.zero

b. ϵ_0

c. $1/4\pi\epsilon_0$

d. $4\pi\epsilon_0$

42Alpha particles are ----- nuclei.

a.Ca

b.He

c.Mg

d.Cu

43 Which of following is atomic model.

A. Bohr

b. Rutherford

c. Thomson

d. all

44. According to Bohr atomic model , the electrons are revolve in. ----- orbits.

a. Stationary, circular

b. Stationary, elliptical

c. radiating circular

d. none of these.

45. In hydrogen spectrum, -----series lies in ultraviolet region.

a. Lyman

b. Balmer

c. Paschen

d. Bracket

46. The value of Rydberg constant is of the order of

a. 10^{-7}m^{-1}

b. 10^{+7}m^{-1}

c. 10^{+7}m^{+1}

d. 10^{+14}m^{+1}

47. Nucleons are

- a. Protons and neutrons
- b. Protons and electrons
- c. Electrons and neutrons
- d. all of above.

48. The transition from initial state $n = 3, 4, \dots$ to final state $n = 2$ is

- a. Lyman
- b. Balmer
- c. Paschen
- d. Brackett

49. If the wave length for the wave is 6000 \AA , then the wave no. is

- a. $1.66 \times 10^7 \text{ m}^{-1}$
- b. $1.66 \times 10^6 \text{ m}^{-1}$
- c. 1 m^{-1}
- d. $16.6 \times 10^7 \text{ m}^{-1}$

50. The total energy of electron in the ground state of atom is

- a. zero
- b. less than zero
- c. more than zero
- d. none of these.

51. In the H_2 molecule, the hydrogen atoms sharing ----- electrons via covalent bonding.

a. 1

b. 2

c. 3

d. 4

52. The reduced mass of a diatomic molecule is

a. $m_1 / (m_1 + m_2)^2$

b. $m_1 / m_1 + m_2$

c. $m_1 m_2 / m_1 + m_2$

d. $m_2 / m_1 + m_2$

53. Two atoms make nonpolar covalent bonds when their electronegativity is

a. equal

b. double

c. triple

d. none of these.

54. A covalent bond formed by the mutual sharing of one electron pair between two atoms is called as -----

a. single covalent bond

b. double covalent bond

c. triple covalent bond

d. none of these.

55. Gamma rays have ----- energy.

a. moderate

b. low

c. high

d. zero

56. The proof of the existence of electromagnetic wave came from ----- experiment.

a. Maxwell

b. Hertz

c. Marconi

d. Faraday

57. The use of microwave for

a. Microwave oven

b. Radar

c. communication

d. all

58. The wave length of wave is 300 cm, then the frequency is.

a. 10^8 Hz.

b. 10^{-8} Hz.

c. 1Hz

d. 10^{10}Hz .

59. The radius of first Bohr orbit is 0.52A^0 , what is the radius of 3rd orbit ?

a. 4.86A^0

b. 1A^0

c. 48.6A^0

d. 0A^0

60. The Radar is used for

a. ground mapping

b. weather forecast

c. airport surveillance

d. all of these.

61. What is the full form of LASER?

a. Light Absorbent and Stimulated Emission of Radiations

b. Light Absorbing Solar Energy Resource

c. Light Amplification by Stimulated Emission of Radiations

d. Light Amplification of Singular Emission of Radiations

62. Phonons are _____

a. Quanta of energy

b. Quanta of light waves

c. Quanta of sound waves

d. Quanta of heat

63. Which of the following is not a characteristic of LASERS?

- a. Monochromatic**
- b. Coherent**
- c. Divergent**
- d. Intense**

64. Laser is used in LIDAR for what purpose?

- a. High-Speed Photography**
- b. Range finder**
- c. Optical Carrier signal**
- d. Drilling**

65. The output of a laser has pulse duration of 30 ms and average output power of 1W per pulse. How much energy is released per pulse if wavelength is 6600\AA ?

- a. 0.001J**
- b. 0.002J**
- c. 0.003J**
- d. 0.004 J**

66. Lasers are used for welding of wires because they can be focused onto a fine spot.

- a. True**
- b. False**

67. Where is ND: YAG most commonly used?

- a. Cosmetic Surgery**
- b. Welding**

c. Photography

d. Optical Communications

68 Which characteristic of LASER allows it to be used in holography?

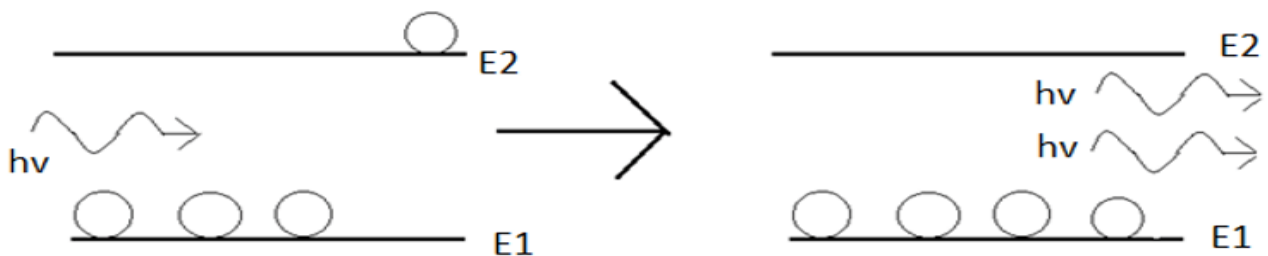
a. Coherency

b. Directionality

c. Intensity

d. Monochromaticity

69. The following graph is pictorial representation of _____



a. Spontaneous emission

b. Spontaneous Absorption

c. Stimulated emission

d. Stimulated Absorption

70. He- Ne laser offers ----- optical pumping.

a. two level

b. three level

c. four level

d. none

71. Around 1911, Rutherford suggested a planetary model of atomic structure. Which of the following was not a proposition of this model?

- a) Electrons revolve in circular orbits around the nucleus
- b) Nucleus consists of protons and neutrons
- c) Mass of atom is concentrated in the nucleus
- d) Most of the volume in an atom is void

72. Which of the following orbitals do not exist?

- a) 3p
- b) 4s
- c) 2s
- d) 3f

73. When an electron shifts to an inner shell, it:

- a) Absorbs photon
- b) Emits a photon
- c) Emits a positron
- d) Absorbs a positron

74. Which of the following rays are not electromagnetic waves?

- a. Gamma rays
- b. Beta rays
- c. Heat rays
- d. X rays

75. Which properties amount the following is false about electromagnetic waves?

- a. The energy in an electromagnetic wave is divided equally between electric and magnetic vectors.
- b. Both electric and magnetic field vectors are parallel to each other and perpendicular to the direction of propagation of the wave.
- c. These waves do not require any material medium for propagation
- d. Both electric and magnetic field vectors attain the maxima and minima at the same place and the same time.

76. The energy of photon of wavelength λ is :

a. $hc \lambda$.

b. $\frac{\lambda}{hc}$

c. hc/λ

d. $\frac{\lambda h}{c}$

77. A quantum of light energy is called as

a. proton

b. photon

c. electron

d. neutron.

78. ----- is phenomena exhibit particle nature of light.

a. Interference.

b. Diffraction.

c. Polarisation.

d. Photoelectric effect.

79. The energy radiated from a source is in the form of -----

a. atom.

b. proton.

c. photons.

d. electrons.

80. The rest mass of photon is -----

a. $9 \times 10^{-31} \text{ kg}$

b. $1.76 \times 10^{-35} \text{ kg}$.

c zero.

d. One a.m.u.

81. In Rutherford's atomic model all the +ve charge of the atom lies in the---

a. nucleus

b. orbit

c. space between nucleus and orbits

d. none of these.

82. For the hydrogen atom, when an electron revolves in first orbit, it is said to be in

.....

a. equilibrium state

b. excited state.

c. ground state.

d. metastable state.

83. The energy of an electron in the nth orbit is proportional to .-----

a. n^2

b. n

c. $1/n$

d. $1/n^2$

84. According to Bohr, energy radiation takes place when,

- a. electron jumps from lower stationary orbit to higher energy stationary orbit.
- b. electron jumps from higher stationary orbit to lower energy stationary orbit.
- c. moves in any stationary orbit.
- d. none of these.

85. The lowest orbit, in the Bohr's model, corresponds to ----- energy.

- a. infinity.
- b. zero.
- c. maximum.
- d. minimum.

86. When an electron lifts from the ground level to an excited level then its -----

- a. potential energy decreases and kinetic energy increases.
- b. potential energy increases and kinetic energy decreases.
- c. both energies increase.
- d. none of these.

87. The unit of Rydberg's constant is

- a. per metre
- b. per m^2
- c. per kg
- d. per sec.

88. The Balmer series is observed in ----- region of electromagnetic spectrum.

a. far infrared.

b. ultraviolet.

c. infrared.

d. visible.

89. When transition takes place from $n=4,5,6,7$, ----- to $n=3$, corresponds to -----

a. Lyman series.

b. Pfund series.

c. Bracket series.

d. Paschen series.

90. Which of the following has longest wavelength ?

a. gamma ray

b. ultraviolet

c. infrared.

d. visible light.

91. H_{β} , H_{α} and H_{γ} lines are observed in -----

a. Lyman

b. Balmer.

c. Paschen

d. Bracket.

92.The condition of population inversion is -----

a. $N_2 \gg N_1$

b. $N_2 \ll N_1$

c. $N_1 = N_2$

d. none of these.

93.In He-Ne laser , the discharge tube , consist of the He and Ne gases in the proportion of –

a. 10:1

b. 1:5

c. 1:1

d. 1:2

94.A covalent bond formed by the mutual sharing of two electron pair between the atoms is called as----- covalent bond.

a. single

b. double.

c. triple.

d. none of these.

95.The H_2O is formed by -----

a. ionic bonding

b. covalent bonding.

c. hydrogen bonding.

d. metallic bonding.

96. The energy of the rigid rotator is $E_{\text{rot}} = l(l + 1) \frac{h^2}{8\pi^2 I}$, here l is -----

a. principal quantum number.

b. angular momentum.

c. orbital angular quantum number.

d. spin quantum number.

97. The expression $\mu = \frac{m_1 m_2}{m_1 + m_2}$ in diatomic molecule gives -----

a. relativistic mass

b. rest mass

c. reduced mass

d. virtual mass.

98. The metal atoms Na, K, Mg are ----- in Nature.

a. electropositive

b. electronegative.

c. Neutral.

d. None of these.

99. The speed of Electromagnetic wave is same for ,

a. medium

b. λ

c. v

d.phase.

100. Radar is used for ,

a.remote sensing.

b.weather condition.

c.guiding the space vehicle.

d.all .