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**Class 12**

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# 1 MARKS BLASTER PDF

## CLASSIFICATION OF QUESTIONS

**SUBJECT:**

# PHYSICS

**MR. SS PRITHVI**

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CJ,TU

# CLASSIFICATION OF BOOK BACK 1 MARK QUESTIONS BASED ON TYPE

- ANGLE ORIENTED QUESTIONS
- Increases – Decreases Related Question
- GENERAL QUESTIONS
- FORMULA ORIENTED QUESTIONS
- Problem Oriented One Mark Questions
- TWISTED QUESTIONS

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# PHYSICS VOLUME – I & II

**"ANGLE" ORIENTED QUESTIONS :-**

1. Electric Dipole is placed parallel to the uniform field, then torque is
   a) zero b) maximum
   c) minimum d) either of these
2. Electric dipole is placed perpendicular to the uniform field then torque is
   a) zero b) max
   c) min d) None of these
   (Note: In uniform field force exerted on the dipole is zero.
   - In Non uniform field, force exerted on the dipole is Non-zero.)
3. The angular difference between the direction of torque and the plane which contains electric field and dipole moment is
   a) zero b) $\pi/2$ c) $\pi$ d) $2\pi$
4. The potential energy of electric dipole in electric field which is anti parallel to the field is
   a) $U = -PE$ b) U= 0 c) U= + PE d) both (a) and (b)
5. The angle between the direction of work done on the test charge and the field of charge +q is
   a) 0 b) 90° c) 180° d) 360°
6. To an infinite long straight charged wire, flux at the plane caps (Gaussian surface)cylinder is zero because area vector is
   a) parallel to E b) perpendicular to E
   c) opposite to E d) along E
7. The angle between the current and the magnetic field induced around the current carrying conductor
   a) 0° b) 90° c) 180° d) 360°
8. A charge –q is moving parallel the magnetic field,then force on the charge is
   a) +Bqv b) –Bqv c) zero d) maximum
9. The angular difference between the magnetic Lorentz force and plane containing $\overline{B}$ and $\overline{V}$, is
   a) 90° b) 180° c) 360° d) 270°
10. Work done on the charge q, by the magnetic Lorentz force is zero because
    a) Force is always perpendicular to v b) Force is Parallel to v
    c) $\overline{F}$ and $\overline{v}$ acting in same plane d) Force is zero

11. The velocity of the charged particle in cyclotron is increased by
    a) magnetic field b) electric field
    c) both electric and magnetic field d) none of these
12. A current carrying conductor is placed perpendicular to magnetic field, the magnitude of force is
    a) BIL b) zero c) minimum d) BIL cosθ
13. The direction of force on a current carrying conductor, in the magnetic field is
    a) perpendicular to the plane containing $\overline{Il}$ and $\overline{B}$
    b) parallel to the plane containing $\overline{Il}$ and $\overline{B}$
    c) parallel to $\overline{B}$
    d) parallel to $\overline{Il}$
14. The current carrying rectangular coil is parallel to the magnetic field, then torque exerted is
    a) zero b) nBIAcosθ c) nBIA d) –nBIA
15. In moving coil galvanometer, the angle between the normal of rectangular coil and field is always
    a) 90° b) 0° c) 180° d) 270°
16. The direction of magnetic moment, due to a current loop is
    a) parallel to the plane of the loop
    b) along the plane of the loop
    c) normal to the plane of the loop
    d) Both (a) and (b)
17. When a coil is placed parallel to the magnetic field, then induced emf is
    a) maximum b) minimum c) zero d) none of these
18. When the coil is placed parallel to the magnetic field, then the flux linkage is
    a) maximum b) minimum c) zero d) none of these
19. Angle between area and area rector is
    a) 0 b) $\pi/2$ c) $\pi$ d) $2\pi$
20. If the motion of the conductor is parallel to the magnetic field, then emf induced in it is
    a) NBA b) NBA$\omega$ c) zero d) $\frac{d\emptyset}{dt}$
21. Mutual Induction is small, when two coils are wound
    a) parallel b) perpendicular
    c) along the same axis d) None of these

22. Thin laminated holes drilled, metal plate swings parallel to the magnetic field. Eddy produced in the plate is
a) minimum b) maximum
c) zero d) varies from zero to maximum

23. In transformer the phase difference between applied emf and induced emf is
a) 0° b) 180° c) 90° d) 45°

24. In RLC circuit, Inductive reactance advances capacitive reactance by
a) $\pi/2$ b) $\pi$ c) $2\pi$ d) $\emptyset$

25. In RLC circuit at resonance condition, phase angle $\emptyset$ is
a) $\pi/2$ b) $\pi$ c) $2\pi$ d) 0

26. The magnitude of current flowing through RLC circuit is
a) same b) maximum through Inductor
c) advances $V_C$ by 180° d) lags $V_L$ by 180°

27. In earth's magnetic field, emf induced on the wings of air craft is due to
a) horizontal component of earth
b) vertical component of earth
c) Both (a) and (b)
d) None of these

28. The angle between $\overline{E}$ and $\overline{B}$, in an em wave is
a) 0 b) $\pi/2$ c) $\pi$ d) $2\pi$

29. The direction of propagation of em waves is
a) parallel to both $\overline{E}$ and $\overline{B}$
b) along the direction of $\overline{E}$
c) perpendicular to both $\overline{E}$ and $\overline{B}$
d) perpendicular to $\overline{B}$ alone

30. The angle of incidence of plane wave front is 30°, then the angle between the incident wave front and reflecting surface is
a) 60° b) 90° c) 30° d) 45°

31. The angle between the direction of propagation and the wave front is
a) 0° b) 45° c) 90° d) 180°

32. If a light passing from rarer medium to denser medium then
a) i< r b) i = r c) r = 90° d) i> r

33. When light passing from denser to rarer medium, then
a) i< r b) i = r c) r = 90° d) i> r

34. At the critical angle, the angle of refraction
a) r> 90° b) r = 90° c) i = r d) i = 90°

35. In transverse vibration, the direction of vibration is
a) parallel to the direction of wave propagation
b) perpendicular to the direction of wave
c) depend on the medium
d) either (a) or (b)

36. A light ray incident on a thin film, the angle of refraction r = 0; when
a) i = 90° b) i = 45° c) i = 0° d) i = 60°

37. In Newton's ring experiment, the phase difference between the two rays which are reflected by a denser and rarer medium
a) $\pi/2$ b) $\pi$ c) $2\pi$ d) 0

38. By increasing the number of grating element, the order of diffraction can be
a) increased b) decreased
c) remains the same d) does not depend on N

39. At the polarizing angle, the angle between the incident ray and refracted ray is
a) 2 ip b) ip c) 90° d) 2 $i_p$ + 90°

40. The plane of polarization and the plane of vibrations are ____ to each other
a) parallel b) perpendicular
c) the same d) either (a) or (b)

41. The polarizing angle for glass is 57.5°. The angle between the incident ray and the reflecting surface is
a) 57.5° b) 115° c) 32.5° d) 90°

42. In calcite crystal no double refraction takes place, only when ordinary and extra ordinary ray travels
a) perpendicular to each other b) with same velocity
c) along optic axis d) both (b) and (c)

43. In a T.G, for a constant current, the deflection is 30°. The plane of the coil is rotated through 180°, for the same current deflection will be
a) 30° b) 60° c) 90° d) 0°

44. The phase difference between the two points on a given wave front is
a) 0° b) 90° c) 60° d) 180°

45. The angle between the ray and the wave front is
a) 0° b) 90° c) 180° d) 360°

46. In longitudinal wave, the angle between the vibration of particles and the direction of wave is
a) 0° b) 90° c) 270° d) 360°

47. Induced dipole moment in a dielectric to the applied electric field, is at an angle of
a) 0° b) 90° c) 180° d) 270°

48. Refractive index of a medium is inversely proportional to the sine of critical angle, when light passes from denser medium to rarer medium. Then
a) i< c b) r < 90° c) i = c d) i> r

49. In the presence of external field ($E_0$) in a dielectric, the induced electric field ($E_i$) is
a) along the direction of external field ($E_0$) b) opposite to $E_0$
c) perpendicular to $E_0$ d) either (b) or (c)

50. The phase difference between input current and output current of a transformer is
a) 0° b) 30° c) 180° d) 90°

51. The direction of eddy to the magnetic field is
a) parallel to B b) perpendicular to B
c) does not depend on B d) either (a) or (b)

52. Average power consumedby an RLC circuit is maximum, when $\emptyset$=
a) 180° b) 90° c) 0° d) 60°

53. The force on an charged oil drop is maximum, when it moves
a) parallel to $\overline{B}$ b) parallel to $\overline{E}$
c) perpendicular to $\overline{B}$ d) both (a) and (b)

54. In $\propto$-particle scattering experiment, the angle between incident particle and scattered particle in backward direction is
a) 0° b) 180° c) 90° d)

55. In an atom the angle between electro statatic fore of attraction and linear velocity of electron is
a) 0° b) 180° c)90° d) 360°

56. In Bragg spectrometer as θ increases, the order of spectrum also increases but intensity decreases. Here θ is
a) angle of diffraction
b) angle of polarisation
c) angle between incident ray and lattice plane
d) angle between incident ray and reflected ray

57. If a charged particle enters in a region of electric and magnetic fields which are perpendicular to each other, then force on it at the balanced state is
a) zero b) minimum c) maximum d) either (b) or (c)

58. When the angle of incidence for an em wave is large, than the skip distance becomes
a) lesser b) zero
c) larger d) depends on the location of transmitter

59. The phase difference between the motion geostationary satellite and the earth is
a) 0 b) $\pi/2$ c) $3\pi/2$ d) $\pi/4$

## 'Increases – Decreases' Related Questions

1. By doubling the distance, the force between two point charge decreases by
a) 2 times b) 4 times c) 8 times d) does not charge

2. In a dielectric medium, force between the two point charge (dielectric const$\varepsilon_r = 6$)
a) decreases by 6 times b) increases by 12 times
c) increases by 3 times d) has no change

3. In a medium of dielectric const$\varepsilon_r$, the number of lines of force originated from a positive charge +q is
a) increases by $\varepsilon_r$ times b) increases by $\varepsilon_0$
c) decreases by $\varepsilon_r$ times d) does not depend on medium

4. Against the direction of electric field, potential difference between two points
a) increases b) decreases
c) zero d) may increase or decrease

5. If the magnitude of charges increases by 2 times, then force between them
a) increases by 2 times b) increases by 8 times
c) increases by 4 times d) decrease by 4 times

6. The work is done on a charge ($q_0$) against the electric field of q, then potential energy between them is
a) decreases b) no change
c) increases d) may increase (or) decrease

7. Torque (τ) exerted on a dipole, placed an angle with electric field, can be increased by
a) increasing electric field b) placing at an angle 90°

c) decreasing electric field d) both (a) and (b)

8. Electric potential at a point due to a charge (+q) increases by
   a) decreasing distance
   b) increasing distance
   c) when placed in dielectric medium
   d) decreasing the magnitude of charge
9. By doubling the charge on a hollow sphere, the capacitance of sphere becomes
   a) halved b) doubled
   c) increases 4 times d) remains the same
10. Capacitance of a charged conductor
   a) increasesby increasing charge
   b)increases by decreasing potential
   c) remains the same d) both (a) and (b)
11. In a parallel plate capacitor, positive potential of X plate is
   a) decreased by negative potential of Y plate
   b) increased by negative potential of y plate
   c) does not charge
   d) either (a) or (b)
12. By increasing the distance of separation twice, then new capacitance will be
   a) doubled b) no change
   c) halved d) does not depend on distance
13. By increasing the radius of spherical Gaussian surface, the flux due to the charge +q
   a) increases b) decreases
   c) may increases or decreases d) remains the same
14. The capacitance of the parallel plate capacitor can be increased by
   a) increasingarea b) Introducing dielectric slab
   c) decreasing the distance of separationd) all the above
15. In 'n' capacitors of equal capacitances(C) are connected in series, the effective capacitance is
   a) increases by 'n' times b) decreases by n times
   c) either (a) or (b) d) equal to c
16. The velocity of free electrons in a metal increases, due to
   a) increase of potential difference b) increase of resistance
   c) decrease of electric field d) decrease of potential difference
17. The resistance offered by the conductor can be decreased by
   a) decreasing current b) decreasing voltage
   c) increasing cross sectional area d) remains the same

18. The specific resistance of a material can be changed by
    a) increasing length area of cross section
    b) increasing area of cross section
    c) decreasing resistance
    d) remains constant
19. For a given constant current through the wire, the current density can be increased by
    a) decreasing length
    b) increasing resistance
    c) decreasingarea of cross section
    d) increasing area of cross section
20. For a given conductor, mobility
    a) can be increased by increasing drift velocity
    b) can be decreased by increasing electric field
    c) is constant
    d) both (a) and (b)
21. 'n' resistors of equal resistance are connected parallel, the effective resistance
    a) decreases by $n^2$ times  b) decreases by n times
    c) increases by n times  d) increases by $n^2$ times
22. The emf of the given cell is decreases, due to the
    a) increase of external resistance
    b) decrease of external resistance
    c) increase of internal resistance
    d) decreases of internal resistance
23. When the temperature of conductor increases, them its $\propto$ value
    a) increases  b) decreases
    c) depends on temperature  d) remains the same
24. When the temperature of conductor increases, it resistance value
    a) increases  b) decreases
    c) remains the same  d) zero
25. In a potentiometer, emf of the cell is directly proportional to the
    a) current  b) resistance per unit length
    c) balancing length  d) galvanometer resistance
26. For a given constant current,electric power consumed by a device is
    a) directly proportional to resistance
    b) inversely proportional to resistance
    c) either (a) or (b)
    d) does not depends on resistance

27. For constant voltage, the heat radiated from a wire is
a) directly proportional to resistance
b) inversely proportional to resistance
c) either (a) or (b)
d) inversely proportional to time

28. For a given thermo couple, neutral temperature
a) increased by increasing $\theta_c$
b) increased by decreasing $\theta_i$
c) remains the same
d) both (a) and (b)

29. The emf induced in a thermopile is increases by
a) increasing intensity of source
b) decreasing intensity of source
c) pairs of metals Hg-Fe d) either (a) or (b)

30. The magnetic field induction due to the current carrying conductor, does not depends on
a) distance
b) length of current element
c) medium at which the conductor located
d) type of material

31. The magnetic induction due to a current carrying conductor, can be increased by
a) introducing in a medium of permeability ($\mu$r)
b) decreasing the distance
c) increasing the current
d) all of these

32. The Reduction factor of T.G can be increased by
a) Increasing current b) decreasing 'tanθ'
c) constant for a given T.G d) decreasing the radius of T.G

33. The magnetic Lorentz force on a charge does not depends on
a) velocity of the charge
b) angle between velocity of charge and field
c) mass of the charge d) all of the charge

34. In cyclotron, the radius of path of charge is increased by increasing
a) mass of the charge b) magnetic field applied
c) electric field applied (HFO) d) all of these

35. In cyclotron, of the following which increases, during the revolution
a) magnetic field b) charge of particle

c) time period d) velocity of particle

36. If magnetic field strength on the moving charge increases, then
a) velocity increases b) force increases
c) charge increases d) velocity decreases

37. The work done on the moving charged particle by magnetic lorentzforce ,can be increased by increasing
a) field induction b) charge of particle
c) velocity of particle d) none of these

38. In cyclotron, the frequency of charged particle in uniform field can be varied by varying
a) magnetic field b) charge
c) velocity d) both (a) and (b)

39. A current carrying conductor is placed along the direction of field. Force on the conductor can be increased by increasing
a) current b) current element
c) field induction d) none of these

40. The force between two long parallel, current carrying conductors increases by
a) increasing current
b) introducing a medium of $\mu$r
c) decreasing the distance
d) all of these

41. The net force experienced by a current carrying rectangular coil placed parallel to the field is
a) increased by B b) increased by A
c) always zero d) both (a) and (b)

42. The ratio between current sensitivity and voltage sensitivity of galvanometer is
a) couple per twist b) galvanometer constant
c) galvanometer resistance d) conductance of galvanometer

43. The ratio between voltage sensitivity and current sensitivity of galvanometer is
a) galvanometer constant
b) reduction factor
c) conductance of galvanometer
d) couple per twist

44. The voltage sensitivity can be increases by
a) increasing number of turns b) decreasing couple per twist
c) decreasing area of coil d) increasing current

45. The range of ammeter can be increased by
a) decreasing shunt value b) increasing current (I)

c) increasing $I_g$ d) increasing shunt value

46. The magnetic flux linkage with the surface can be increased by
a) increasing field induction
b) increasing area of surface
c) placing the surface perpendicular to field
d) all of these

47. The self inductance of a coil can be increased
a) increasing the induced emf
b) decreasing rate of change of current
c) increasing area
d) increasing the length

48. The mutual inductance between two coils is increases when
a) number of turns increases
b) placing them perpendicular to each other
c) soft iron core is used
d) both (a) and (c)

49. An emf induced in a coil is maximum when
a) rate of change in flux is maximum
b) coil is perpendicular to field
c) flux is maximum
d) all of these

50. Ina three phase AC generator
a) emf's induced in each coil is different
b) number of turns are different
c) they are differing in phase
d) frequency is different

51. In a transformer, secondary current is decreased by
a) increasing primary voltage b) decreasing secondary voltage
c) increasing secondary voltage d) decreasing primary current

52. The phase angle Φ is positive in RLC circuit, when
a) $X_L = X_C$ b) $X_L > X_C$ c) $X_C > X_L$ d) $R = 0$

53. The power factor (cosΦ) for a choke coil can be increased by
a) increasing the capacitance
b) decreasing the inductance
c)increasing angular frequency
d) all of these

54. Of the following, which is constant in a transformersduring step up process.
a) power b) frequency c) voltage d) current

55. The ratio of velocity of x ray and visible light of wavelength 1A° and 5000A° respectively is
a) 1 : 5000 b) 5000 : 1 c) 1 : 1 d) none of these

56. When light travels between two media of refractive indices are 1 and 1.5 respectively, then for light
a) wave length increases
b) frequency increases
c) velocity increases
d) frequency is const

57. The difference in frequency of stokes and anti stokes lines is
a) $\Delta\gamma$ b) $-\Delta\gamma$ c) $2\Delta\gamma$ d) $\gamma_0$

58. The band width ($\beta$) is increased by
a) increasing wavelength of light
b) increasing the source distance
c) decreasing the screen distance
d) all of these

59. When crest of one wave meets, the trough of another wave, then intensity at that point
a) increases
b) decreases
c) may increase or decrease
d) none of these

60. The path difference between the two wavelet arriving at grating, is increases when
a) width of the grating element increases
b) refractive index of grating increases
c) wave length of light decreases
d) all of these

61. The velocity of cathode rays depends up on
a) gas enclosed in the discharge tube
b) the metal used as cathode
c) potential difference
d) thegeometry of discharge tube

62. In Millikan's oil drop experiment,at the balanced state
a) E = B b) v = E/B c) Eq = mg d) all of these

63. In $\propto$- particle scattering, the distance of closest approach depends on
a) velocity of $\propto$ particle b) mass of $\propto$ particle
c) charge of nucleus d) all of these

64. According to the Rutherford atom model, path of electron is

a) circular b) elliptical c) spiral d) straight line

65. The ratio of angular momentum of electron in second and third orbit is
a) 2 : 3 b) 3 : 2 c) 1 : 1 d) 1 : 2

66. The ratio of energy of electrons in first and second orbit is
a) 4 : 1 b) 1 : 4 c) 1 : 1 d) 1 : 2

67. The ratio of frequency and wave number is
a) wavelength of light b) velocity of light
c) time period d) energy of light

68. The wave length of last line of lyman series
a) R b) $R^2$ c) $1/R$ d) 0

69. The ratio of wave number between the last lines of Balmer and Paschen series
a) 9 : 4 b) 2 : 3 c) 3 : 2 d) 1 : 4

70. The ratio of first excitation potential energy and first excitation potential for hydrogen atom is
a) energy of electron b) charge of electron
c) wave length of spectral line d) frequency of light

**GENERAL QUESTIONS:-**

1. Velocity of photo electron depends on (for a given photo sensitive metal)
   a) work function of metal b) intensity incident light
   c) frequency of incident light d) all of these
2. The barrier potential for silicon is
   a) 0.7 V b) 0.7 eV c) 1.1 V d) 1.1 eV
3. An aluminum wire has resistance R on doubling its length, the new resistance
   a) increases by 2 times b) increases by 4 times
   c) decreases by 2 times d) remain same
4. Principle used in room heater is
   a) corona discharge b) electromagnetic induction
   c) Joules law of heating d) self induction
5. Comparing to the PN junction diode, break down voltage for zener diode is
   a) move b) less c) same d) none of these
6. Principle used in choke coil
   a) mutual induction
   b) Joules law of heating
   c) self induction
   d) resonance
7. Lightly doped collector region is large in size because, it has to
   a) supply charge carriers b) accept majority charge
   c) to conduct high current d) none of these
8. The electric flux passing inward due to the charge of 1 coulomb
   a) $1.129 \times 10^{11}$ b) $-1.6 \times 10^{-19}$ c) $8.854 \times 10^{12}$ d) $-1.129 \times 10^{11}$
9. Flux lines due to an isolated electron is
   a) $1.8 \times 10^{-8}$ b) $1.6 \times 10^{-19}$ c) $8.854 \times 10^{12}$ d) $1.129 \times 10^{11}$
10. By doubling the external resistance emf of the cell becomes
    a) halved b) doubled c) no change d) either (a) or (b)
11. The current 1A, 2A, and 3A flowing through the heating coils of identical resistances. Then the rate of heat lost by them is
    a) 1 : 2 : 3 b) 1 : 8 : 27 c) 1 : 4 : 9 d) 1 : 1 : 1
12. For a given thermocouple by decreasing the temperature of cold junction by 20°C,then
    a) $\theta_n$ increases by 20°C
    b) $\theta_i$ decreases by 20°C
    c) $\theta_n$ decreases by 20°C
    d) $\theta_i$ increases by 20°C

13. The direction of magnetic field due to solenoid is given by
    a) maxwells right hand cork screw rule
    b) flemings left hand rule
    c) end rule
    d) right hand palm rule
14. For a transistor action in CB mode, collector-base junction is reverse biased, hence it offers
    a) low resistance b) zero resistance
    c) high resistance d) infinite resistance
15. In light emitting diode, emission of photon is due to recombination by
    a) electron from conduction band to hole in valence band
    b) hole in conduction band to electron in valance band
    c) either (a) or (b)
    d) high potential difference
16. Transistor is an
    a) voltage operating device b) current operating device
    c) both (a) and (b) d) neither (a) and (b)
17. For a good transistor action, input impedance must be
    a) zero b) low c) high d) equal to o/p impedance
18. Unit of wave number is
    a) m b) $m^{-1}$ c) no unit d) Å
19. Unit of disintegration constant is
    a) m b) per day c) day d) MeV
20. The angle of refraction, when the light incident on thin film normally is
    a) 0 b) $\pi/2$ c) $\pi/4$ d) $\pi$
21. By increasing the number of lines per unit length in a grating the order of spectrum
    a) increases b) decreases c) no change d) none of these
22. For a voltmeter
    a) Rv< R > G b) Rv< R < G c) Rv> R > G d) G <Rv> R
23. For an ammeter
    a) Ra > S > G b) S > Ra > G c) Ra < S < G d) G > S > Ra
24. Intensity stokes lines comparing with anti-stokes is
    a) greater b) smaller c) equal d) either (a) or (b)
25. Of the following, which coupling is used for the amplification of DC signals
    a) capacitor coupling b) RC coupling

c) transformer coupling d) direct coupling

26. Range of voltmeter can be increased by
a) increasing resistance R b) decreasing resistance (R)
c) decreasing current I d) increasing current I

27. The range of ammeter can be decided by
a) galvanometer resistance b) shunt resistance
c) both (a) and (b) d) none of these

28. In RLC circuit, if the circuit is predominantly capacitive than $\emptyset$ is
a) positive b) zero c) negative d) $\pi/2$

29. (A + B) (A + C) =
a) A + B b) A + C c) A + B + C d) A + BC

30. In Op-Amp null adjustment pins are used
a) for high gain b) to give low impedance
c) for perfect balance d) to give high impedance

31. In negative feedback, phase shift produced by feedback network
a) $\pi$ b) $\pi/2$ c) 0 d) $2\pi/3$

32. By increasing the accelerating potential,theDe-brogliewave length of electron
a) does not depends on potential b) decreases
c) increases d) remains the same

33. The ratio of frequencies of incident ray and refracted ray is
a) 1 : 4 b) 2 : 1 c) 1 : 2 d) 1 : 1

34. Practically an inductor has
a) r and $X_L$ b) $X_L$ only c) $X_L$ and $X_C$ d) R, $X_L$ and $X_C$

35. In cascade connection, the effective amplification of two amplifiers of amplification 10 and 20 respectively, is
a) 20 b) 30 c) 2 d) 200

36. Unit of absorption coefficient (when X ray incident of crystal) is
a) $J/m^2$ b) $J/m$ c) per m d) no unit

37. The K.E of photo electron depends on (for a given material)
a) angle of incidence of light
b) work function
c) no. of photons incident/area
d) wave length of light

38. "The moving charged particles can be deflected by electric and magnetic field"- is the principle used in
a) CRO b) van de graff generator
c) potentiometer d) vidicon camera tube

39. The nuclear radiations can produce ionization in an molecules through which they pass – is used in
    a) GM counter b) X-ray spectrometer
    c) see back effect d) JJ Thomson experiment
40. Principle used in vidicon camera tube
    a) photo conductivity b) photo sensitivity
    c) current sensitivity d) ionization
41. At the receiving end the emwave is changed in their
    a) frequency b) modulation strength
    c) energy d) both (a) and (b)
42. "The charged particles can be deflected by electric or magnetic field"- is the principle used in
    a) cathode ray tube b) Bainbridge mass spectrometer
    c) electron microscope d) all of these

**FORMULA ORIENTED QUESTIONS:-**

1. Electrostatic force of attraction between two charges is directly proportional to
    a) permittivity of medium b) square of distance
    c) product of charge d) square of charges
2. The force between the charges, in a medium $\varepsilon_r$, is
    a) directly proportional to $\varepsilon_r$ b) inversely proportional to $\varepsilon_r$
    c) does not change d) none of these
3. The electric field intensity due to a point charge is
    a) inversely proportional to $r^2$ b) directly proportional to $q^2$
    c) inversely proportional to $q^2$ d) directly proportional to $r^2$
4. Electric field intensity due to a dipole is
    a) inversely proportional to $r^2$ b) directly proportional to $q^2$
    c) inversely proportional to $q^2$ d) directly proportional to p
5. Electric potential due to a dipole, on equatorial line is
    a) directly proportional to r b) inversely proportional to p
    c) zero d) both (a) and (b)
6. The flux due to a charge is directly proportional to
    a) magnitude of charge b) permittivity
    c) location of charge d) area of Gaussian surface
7. Electric field due to an infinite charged plane sheet is
    a) directly proportional to $\varepsilon$ b) directly proportional to $\sigma$
    c) directly proportional to distance d) none of these
8. The molecular polarisability is
    a) directly proportional to p b) inversely proportional to E

c) directly proportional to α d) depend on the dielectric material

9. The capacitance of the parallel plate capacitor
   a) directly proportional to $\varepsilon$
   b) directly proportional to area of plate
   c) inversely proportional to distance of plate separation
   d) all of these
10. The potential developed in van-de-Graff generator depends on
   a) applied potential b) metal comp used
   c) charge stored d) geometry of the sphere
   e) both (c) and (d)
11. The specific resistance of the given material is
   a) directly proportional to R b) directly proportional to A
   c) inversely proportional to $l$ d) constant for that material
12. For the given conductor, the current density can be increased by
   a) increasing applied potential
   b) decreasing the cross section area
   c) constant
   d) both (a) and (b)
13. According to ohm's law, the resistance is
   a) directly proportional to potential difference
   b) inversely proportional to current flowing
   c) both (a) and (b)
   d) dependent on temperature
14. For a given conductor, temperature coefficient of resistance is
   a) proportional to decrease in resistance b) positive
   c) negative d) low positive
15. The electrochemical equivalent (z) is,
   a) directly proportional to mass
   b) inversely proportional to current
   c) inversely proportional to time
   d) a constant
16. For the given current, the heat produced in a conductor is
   a) directly proportional to square of resistance
   b) directly proportional to resistance
   c) inversely proportional to resistance
   d) inversely proportional to time
17. The neutral temperature of given thermocouple is
   a) midpoint of $\theta_c$ and $\theta_i$ b) constant
   c) depends up on $\theta_i$ only d) both (a) and (b)

18. The magnetic induction due to a straight conductor carrying current is
    a) directly proportional to distance b) inversely proportional to I
    c) directly proportional to permeabilityd) all of these
19. The magnetic induction due to a circular coil is inversely proportional to
    a) square of radius b) cube of radius
    c) radius d) current
20. Reduction factor is
    a) a constant for a given T.G
    b) directly proportional to radius of coil
    c) inversely proportional to no. of turns
    d) all of these
21. The work done by field B, on a moving charge is directly proportional to
    a) field induction b) velocity of particle
    c) magnitude of charge d) zero
22. The time period of revolution, for a charge particle in cyclotron is directly proportional to
    a) field induction b) charge of particle
    c) mass of particle d) all of these
23. The force on a current carrying conductor in a magnetic field depends up on
    a) current element
    b) magnetic field
    c) angle between the current element and field
    d) all of these
24. The nature of force between two long straight parallel conductors is dependent on
    a) medium ($\varepsilon$) b) current (I)
    c) distance (a) d) direction of current
25. The reciprocal galvanometer constant is
    a) current
    b) voltage sensitivity
    c) couple per twist
    d) current sensitivity
26. The amount of current flowing through ammeter is decided by
    a) galvanometer current b) galvanometer resistance
    c) shunt resistance d) all of these
27. The range of voltmeter is proportional to
    a) G b) $I_g$ c) R d) S

28. The magnetic moment of current loop is
    a) directly proportional to current
    b) directly proportional to length
    c) directly proportional to area of loop
    d) both (a) and (c)
29. The angular momentum of orbiting electron depend on
    a) Planck's constant b) circumference of orbit
    c) principalquantum number d) velocity of electron
30. The magnetic flux linked with surface of area (A) held in magnetic field B, is increased by
    a) increasing magnetic field b) placing the coil parallel to field
    c) increasing surface area d) both (a) and (c)
31. The ratio of flux produced in a coil to the current flowing is
    a) inducedemf b) mutual inductance
    c) induced current d) self inductance
32. The mutual Inductance between two coils is varied by varying
    a) flux linkage
    b) current
    c) number of turns and length of coil
    d) none of these
33. An armature is placed in a uniform magnetic field when rotating the armature, the emf induced in thecoil is directly proportional to
    a) area of coil b) field induction
    c) sin θ d) all of these
34. The efficiency of transformer is directly proportional to
    a) Input power b) input voltage
    c) Input current d) output power
35. The power factor of choke coil inversely proportional to
    a) square of inductance b) capacitance
    c) square resistance d) inductance
36. The velocity of electromagnetic waves is depend on
    a) energy of electric field
    b) energy of magnetic field
    c) the medium through which they pass
    d) all of these
37. In Hentz experiment, the frequency ofem wave emitted is inversely proportional to
    a) the square of light velocity b) square root of inductance
    c) square root of capacitance d) both (b) and (c)
38. Energy of photon is

a) directly proportional to frequency
b) inversely proportional to wavelength
c) constant at all medium
d) both (a) and (b)

39. The ratio between velocity of light in air and water medium gives
a) refractive index of water
b) refractive index of air
c) wave length of light in water
d) frequency of light in air

40. Interference band width β is
a) inversely proportional to screen distance
b) directly proportional to source distance
c) directly proportional to wave length
d) all of these

41. The ratio between radius of 'n'th dark ring in air and liquid is known as
a) wave length of light b) frequency of light
c) refractive index of liquid d) refractive index of air

42. Number of grating elements in a diffraction grating is
a) a reciprocal of width one grating element
b) depend on wave length of light
c) directly proportional to order of spectrum
d) all of these

43. The ratio of charge of electron to the specific charge of electron gives
a) velocity of electron b) acceleration on electron
c) mass of electron d) both (a) and (b)

44. The energy of electron in an orbit is
a) directly proportional to $-n^2$
b) inversely proportional to $-n^2$
c) directly proportional to mass
d) all of these

45. The wave number is the ratio between
a) velocity and frequency b) velocity and wavelength
c) frequency and wavelength d) frequency and velocity

46. The De Broglie wavelength of accelerated electron depends on
a) mass b) velocity
c) accelerating potential d) all of these

47. De-Broglie wavelength of accelerated electron is
a) directly proportional to square root of potential

b) directly proportional to potential
c) inversely proportional to square root of potential
d) directly proportional to mass of electron

48. Nuclear density of a nucleus depends on
a) mass number (A) b) atomic number (Z)
c) volume of nucleus d) constant for all nuclei

49. In Bainbridge mass spectrometer, radius of path of particle is directly is directly proportional to
a) charge b) mass
c) magnetic field d) all of these

50. The product of mean life and disintegration constant is
a) ∞ b) 0 c) 1 d) 0.6931

51. If two amplifiers are coupled, then total gain (A) of the amplifiers is
a) $A_1 + A_2$ b) $A_1 . A_2$ c) $\frac{A_1}{A_2}$ d) $\frac{A_2}{A_1}$

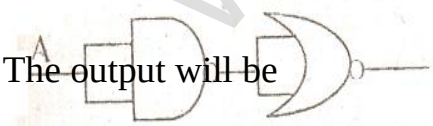
52. The ratio of collector current to the base current is
a) current gain in CC configuration
b) current gain in CE configuration
c) current gain in CB configuration
d) voltage in CB configuration

## Problem Oriented One Mark Questions

1. Find the self-inductance of a coil, when 10 A current flows through it produces the magnetic flux 0.8 weber
a) 8 H b) 12.5 H c) $8 \times 10^{-2}$ H d) 800 H
2. The power loss of a transformer having efficiency 60% and output power 2400 W is
a) 4000 W b) 3200 W c) 800 W d) 1600 W
3. The impendence of the RLC series circuit with R = 15 Ω; $X_L$ = 5Ω; and $X_C$ = 5Ω at resonance
a) 15 Ω b) 25 Ω c) 375 Ω d) 150 Ω
4. A magnetic field of induction 0.6 T through a coil of 200 tuns and 0.02 sq.m of area of cross section reduces to 0.2 T in 0.02 s. Then the emf induced in it is
a) 120 V b) 240 V c) 80 V d) 300 V
5. If the peak value is 50 V, then RMS value of voltage will be
a) 30 V b) 70.7 V c) 35.35 V d) 7.07 V
6. The ratio of peak value to rms value is
a) 1.732 b) $\sqrt{5}$ c) 1.414 d) $\sqrt{7}$
7. An emf of 12 V is induced when the current in the coil changes at the rate of 40 A $s^{-1}$. The co-efficient of self-induction of the coil is
a) 0.3 H b) 0.003 H c) 30 H d) 4.8 H

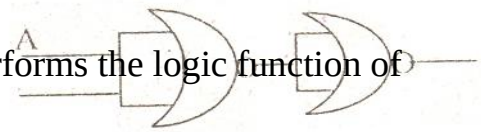
8. In an LCR circuit with impedance of 5 Ω, if the reactance is 3 Ω, the resistance should be
   a) 2Ω b) 4Ω c) 6 Ω d) 8 Ω
9. In a CE transistor amplifier, the gain in the higher cut off frequency is 4, then its mid frequency gain is
   a) $2\sqrt{2}$ b) 8 c) $4\sqrt{2}$ d) $4\sqrt{2}$
10. In a CE transistor $\beta = 50$; $I_C = 0.9$ mA then its $I_B$ value
   a) 18 μA b) 0.2 mA c) 0.1mA d) 10μA
11. When the negative feedback is applied to an amplifier of gain 80, the gain after feedback fall to 60. Calculate the feedback ratio
   a) 1/60 b) 1/80 c) 1/120 d) 1/240
12. Simple form of Boolean expression $A.\ \bar{B} + AB + BC + CA$ is
   a) (A + B)C b) (AB) + C c) A + (BC) d) ABC
13. A CE transistor has the α value 0.99, then its β value is
   a) 9.9 b) 90 c) 99 d) 101
14. When feedback is given to an amplifier, its gain is reduced from 40 to 20. Find the feedback ratio
   a) 0.5 b) 0.05 c) −0.2 d) 0.4
15. A transistor has a collector current 10 mA and collector-emitter voltage 12V. Then the output power dissipation is
   a) 1.2 mW b) 4.14 W c) 120 mW d) 9.4 W
16. A transistor has $\beta = 100$. If the collector current is 40 mA, then the emitter current is
   a) 44 mA b) 40.4 mA c) 404 mA d) 0.4 mA
17. In a transistor when the emitter current is 1 mA, the collector current is nearly equal to
   a) 9 mA b) 1.1 mA c) 1.5 mA d) 1 mA
18. If mid frequency gain = 50 then gain of amplifier at upper cut off frequency region is
   a) 70.7 b) 51.4 c) 354 d) 35.4
19. In a positive feedback amplifier, if A = 90 & $\beta = 1/100$. Then the gain after feedback is
   a) 900 b) 99 c) 9900 d) 9
20. In CE transistor circuit $V_{BE} = 300$ mV & $I_B = 150$ μA, then the input impedance is
   a) 20 kΩ b) 2000 Ω c) 500 Ω d)5 kΩ

21. The output will be



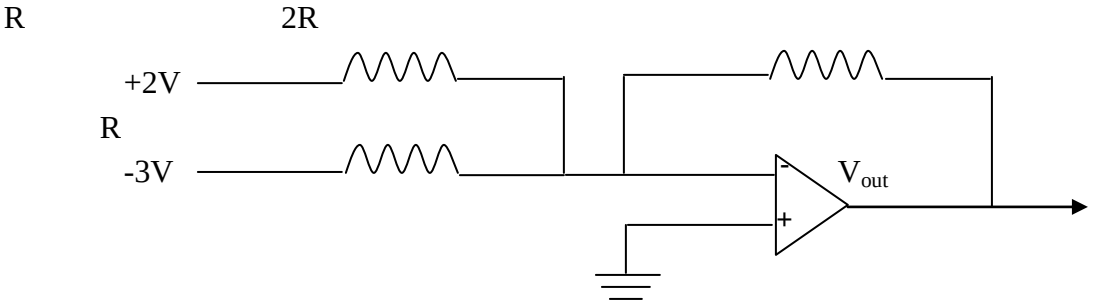
   a) A b) $\bar{A}$ c) 0 d) 1
22. The value of $(\bar{A} + B)(A + B)$ is
   a) AB b) B c) A d) $\bar{A}B$

23. performs the logic function of



a) AND b) OR c) NAND d) EXOR

24. The output voltage of the amplifier (Op – Amp) given below is




a) -1V b) +1 V **c) +2 V** d) -5 V

25. The binding energy of $_{26}Fe^{56}$ nucleus is

a) 8.8 MeV b) 88 MeV c) 493 MeV d) 41.3 MeV

26. For the first order X – ray diffraction, the wavelength of the X – ray is equal to the lattice spacing at a glancing angle of

a) 15° b) 60° c) 45° d) 30°

27. A Coolidge tube operates at 18600 V. The maximum frequency of X – radiation emitted from it is

a) $4.5 \times 10^{18}$ Hz b) $45 \times 10^{18}$ Hz c) $4.05 \times 10^{18}$ Hz d) $45.5 \times 10^{18}$ Hz

28. The reactance offered by 300 mH inductor to an AC supply of frequency 50 Hz is

a) 1046 Ω b) 94.2 Ω c) 9420 Ω d) 104.6 Ω

29. The refractive index of the medium, for the polarizing angle 60° is

a) 1.732 b) 1.414 c) 1.5 d) 1.468

30. When two 2Ω resistances are in parallel their effective resistance is

a) 2 Ω b) 4 Ω c) 1 Ω d) 0.5 Ω

31. In a thermocouple, the temperature of the cold junction is 20°C, the neutral temperature is 270°C. The temperature of inversion is

a) 520°C b) 540°C c) 500°C d) 510°C

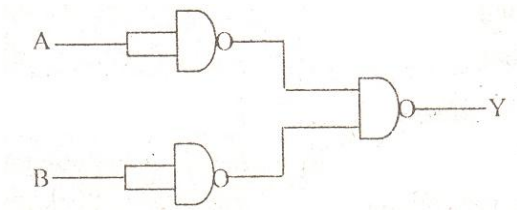
32. In an AM superheterodyne receiver, the local oscillator frequency is 1.245 MHz. The tuned station frequency is

a) 455 kHz b) 790 kHz c)690 kHz d) 990 kHz

33. Voltage across collector resistance 2 kΩ is 8 V. Its collector current is

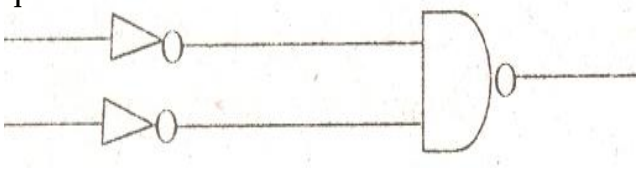
a) 2 mA b) 4 mA c) 16 mA d) 1.6 mA

34. The output of the circuit is



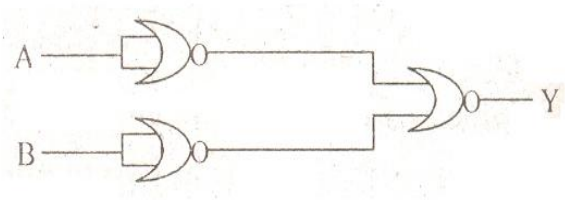
a) y = A.B b) y = A + B c) y = A d) $\bar{y} = \overline{A + B}$

35.The circuit equivalent to



a) AND gate b) OR gate c) NOR d) EXOR

36.The above logic gate circuit behaves like




a) AND gate b) NAND gate c) OR gate d) NOR gate

37. The amplitude ratio of two coherent waves is 5:2. Then their ratio of maximum and minimum intensities

a) 25 : 4 b) 49 : 9 c) 4 : 25 d) 9 : 49

38.The makers formula 'N' of a grating is 6000/cm then the grating element is

a) $6 \times 10^{5}$ m b) $1.66 \times 10^{-6}$ m c) $2.8 \times 10^{-5}$ m d) 3.5 μm

39.A light of wavelength 5000 Å is incident normally on a grating 0.005 m wide will 2500 lines. Find the diffracting angle to get the second order maximum.

a) 30° b) 60° c) 45° d) 90°

40.The path difference between two monochromatic light waves of wavelength 4000 Å is 1000 Å. The phase difference between then is

a) π b) 2π c) 3π/2 d) π/2

41.The radius of $9^{th}$ ring of Newton's ring is 15 mm, then the radius of $25^{th}$ ring is

a) 40 mm b) 22.5 mm c) 25 mm d) 4.46 mm

42.Ratio of radii of $4^{th}$ and $25^{th}$ rings of the Newton's rings is

a) 2.5 b) 0.8 c) 0.4 d) 0.16

43.In the propagation of light waves, the angle between the direction of propagation and plane of polarization is

a) 0 b) 90° c) 45° d) 180°

44.In Raman effect, if the wavelength of the incident light and Anti-stoke's lines are 5461 Å and 5441 Å then wavelength of the stokes lines will be

a) 5451 Å b) 5481 Å c) 5461 Å d) 5420 Å

45.The threshold wavelength to emit electrons from platinum surface is 1972 Å. Then its work function is

a) 3.8 eV b) 6.3 eV c) 1.1 eV d) 8.7 eV

46.The rest mass of an electron is $9.1 \times 10^{-31}$ kg. What will be its mass if it moves with $4/5^{th}$ of the speed of light?

a) $10.23 \times 10^{-31}$ kg b) $7.89 \times 10^{-31}$ kg c) $12.36 \times 10^{-31}$ kg d) $15.16 \times 10^{-31}$ kg

47.When two photons are approaching towards each other, the relative velocity of a photon is

a) 0 b) 2C c) C d) 3C

48. What is the de-Broglie wavelength of an electron of kinetic energy 120 eV?
a) 11.21 Å b) $24.35 \times 10^{-9}$ m c) $1.121 \times 10^{-19}$ m d) 14.5 nm

49. Threshold frequency of a metal is $3 \times 10^{14}$ Hz, then the work function
a) $4 \times 10^{-19}$ J b) $3 \times 10^{-19}$ J c) $2 \times 10^{-19}$ J d) $5 \times 10^{-19}$ J

50. The momentum of the electron having wavelength 1 Å is
a) $3.3 \times 10^{24}$ kg $ms^{-1}$ b) $6.6 \times 10^{24}$ kg $ms^{-1}$
c) $3.3 \times 10^{-24}$ kg $ms^{-1}$ d) $6.6 \times 10^{-24}$ kg $ms^{-1}$

51. The rest energy of electron in MeV is
a) 5.0 b) 0.5 c) 0.05 d) 50.0

52. When photosensitive material of work function 1.6 eV is irradiated by photons of energy 2.4 Ev. Then the stopping potential is
a) 2.0 V b) 0.8 V c) 2.6 V d) 3.4 V

53. An α- particle moves with a speed of $5 \times 10^{5}$ $ms^{-1}$ at an angle of 30° with respect to a magnetic field of induction $10^{-4}$ T. Then the force acting on the particle is (α - particle has the positive charge 2e)
a) $4 \times 10^{-15}$ N b) $8 \times 10^{-18}$ N c) $16 \times 10^{-16}$ N d) $4 \times 10^{-3}$ N

54. 5 A current flows through two long straight parallel wires kept at a distance 10 cm in air. Then the force acting between them per unit length is
a) $4.9 \times 10^{-15}$ N b) $25 \times 10^{-7}$ N c) $5 \times 10^{-5}$ N d) $10 \times 10^{-6}$ N

55. The heat energy developed in a conductor of resistance 10 Ω when 5A current flow through it for a minute is
a) 15000 J b) 3000 J c) 120 J d) 1500 J

56. The force experienced by a conductor carrying current of 2 ampere placed parallel to a magnetic field of 0.2 T (length = 1m) is
a) 0.4 b)0 c) 4 d) 40

57. The Galvanometer has a resistance of 40 Ω and current 5 mA. The shunt to be connected to make it an ammeter of range 2A is
a) 0.1Ω b) 40 KΩ c) 39 Ω d) 0.399 Ω

58. A galvanometer of resistance 50 ohm is hunted with a wire of 10 ohm. The current through the galvanometer when the current in the circuit in the circuit is 12 A is
a) 3 A b) 2 A c) 5 A d) 6 A

59. By passing a current through the coil of TG., if the magnetic field at the centre becomes equal in magnitude to that of horizontal component of earth's magnetic field, then the deflection is
a) 90° b) 0° c) 45° d) 60°

60. A solenoid has a mean diameter of 0.05 m and length 2 m. It has four layers of 1000 turns each. What is flux density at its centre, when a current of 2.5 A flows through it
a) $3.24 \times 10^{-2}$ T b) $6.28 \times 10^{-3}$ T c) $6.28 \times 10^{-4}$ T d) $3.24 \times 10^{-5}$ T

61. The number of pair of ions produced in 1 mg of air by a radiation of about 1 mR
a) $1.6 \times 10^{6}$ b) $1.6 \times 10^{6}$ c) $0.8 \times 10^{9}$ d) $1.2 \times 10^{12}$

62. The time taken to decay 93.75% of a radioactive element is 96 second. Find its half-life period.
a) 48 s b) 72 s c) 24 s d) 12 S

63. The disintegration constant λ of a radioactive element is 0.00231 per day then its mean life is
a) 300days b) 231 days c) 531.4 days d) 432.9 days
64. 15/16 part of a radioactive element decays in 20 days. Its Half-life period is
a) 15 days b) 10 days c) 20 days d) 5 days
65. 7/8 part of the radioactive substance decays in 45 days. Then the half life period of the substance is
a) 45 days b) 25.7 days c) 30 days d) 15 days
66. The diameter of nucleus with mass number 16 is 6 F. What would be the radius of a nucleus of mass number 128?
a) 12 F b) 6 F c) 3 F d) 24 F
67. If 0.53 Å is the radius of first orbit of hydrogen atom them the radius of 3 rd orbit is
a) 1.59 Å b) 2.12 Å c) 6.6 Å d) 4.77 Å
68. The second excitation potential energy required to excite the atom from the ground state of hydrogen atom is
a) 13.6 eV b) 10.2 eV c) 12.09 eV d) 3.4 eV
69. The energy acquired by an electron in $5^{th}$ energy level in a hydrogen atom is
a) -13.6 eV b) -0.54 eV c) 6840 Å d) -2.72 eV
70. In hydrogen atom, the radius of $2^{nd}$ orbit is 2.12 Å, then the radius of fourth orbit is
a) 0.53 Å b) 4.24 Å c) 8.48 Å d) 1.06 Å
71. How much should be the voltage applied in Coolidge tube so that the electrons emitted from the cathode may give an x – ray of wavelength 2 Å after striking the target
a) 1240 kV b) 12400 V c) 6200 V d) 62 kV
72. Find the minimum wavelength of X – ray produced by an X – ray tube at 20 kV
a) 6.2 Å b) 0.62 Å c) 6.2 nm d) 0.62 nm
73. The short wavelength limit of Lyman series is
a) 911.6 Å b) 1215 Å c) 5.64 Å d) 911.6 nm
74. The minimum wavelength of P fund series is
a) 2285 Å b) 22852 Å c) 228520 Å d) 2.28 Å
75. The glancing angle of monochromatic X-ray of wavelength 1 Å is 30°. We get constructive interference of $2^{nd}$ order for this angle. The lattice space is
a) $2 \times 10^{-10}$ m b) $2 \times 10^{-9}$ m c) $2 \times 10^{-10}$ cm d) $2 \times 10^{-19}$ cm
76. The charge on an oil drop is $12.82 \times 10^{-19}$ C, then the number of elementary charges are
a) 6 b) 2 c) 7 d) 8
77. If R is Rydberg's constant, when an electron jumps from the third orbit to the second orbit of a hydrogen atom, the wavelength of the emitted radiation is
a) 36/5R b) 5R/36 c) 6/R d) R/6
78. Two 2 Ω resistances are connected in parallel and in series. What is ratio of their effective resistance.
a) 2 : 1 b) 1 : 2 c) 1 : 4 d) 4 : 1
79. In a carbon resistor it consists of yellow, yellow and black rings at one end and silver ring at the other

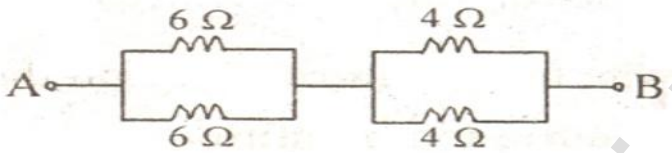
a) 44000 ± 10% Ω b) 440 ± 10% Ω c) 44 ± 10% Ω d) 4400 ± 10% Ω

80. The power consumed by an electric fan of 100W working at 220 V daily 5 hour for a month of 30 days is
a) 1.5 kWh b) 15000 kWh c) 15 kWh d) 30 kWh

81. The ratio of effective resistance when resistances 5 Ω& 3 Ω are connected in series and parallel is
a) 64:15 b) 15:64 c) 5:3 Ω d) 9:25

82. The temperature at which the normal conductor changes to super conductor is called
a) curie temperature b) critical temperature
c) neutral temperature d) inversion temperature

83. The effective resistance between 'A' and 'B' in the given circuit is




a) 5 Ω b) 10 Ω c) 12 Ω d) 8 Ω

84. What is the minimum number of bulbs each marked 60 W, 40 V, that can work safely. When connected in series with a 240 V mains supply
a) 2 b) 4 c) 6 d) 8

85. The balancing lengths of two cells are 250 cm and 750 cm respectively, in a potentiometer experiment. If the emf of the first cell is 2 V, the emf of the second
a) 6 V b) 4 V c) 2/3 V d) 3/2 V

86. In most of the television systems, the frame repetition rate is
a) 25 per second b) 50 per second c) 100 per second d) 30 per second

87. In the interlated scanning is eliminated
a) Flicker effect b) Varrying intensity effect
c) Twinkling effect d) Noise

88. In the interlaced scanning the number of lines per frame is
a) 625 b) 312.5 c) 250 d) 500

89. In modulation the signal wave are loaded over
a) microwaves b) radio waves c) ultrasonic wavesd) infrasonic

90. Transmission antenna converts electric signal in to _____ wave.
a) electromagnetic b) magnetic c) IR d) micro

91. The frequency shift of a wave is 0.03 $MH_Z$. The carrier swing is
a) 0.08 $KH_Z$ b) 60$KH_Z$ c) 0.06 $MH_Z$ d) 0.06 $KH_Z$

92. The energy of a wave is directly proportional to its
a) amplitude b) frequency c) velocity d) wavelength

93. When a current 8A is flowing a conductor of cross section $10^{-6}$ $m^2$, the value of drift velocity of free electron is _____ (n = $10^{28}$electr. /vol.)
a) 5 x $10^7$ m/s b) 5 x $10^{-7}$ m/s c) .5 x $10^7$ d) 5 x $10^{-3}$ $Vm^{-1}$

94. The resistance of a conductor is 10Ω. If it is elongated to two times the original length. The new resistance is
a) 100Ω b) 40Ω c) 20Ω d) 5Ω

95. The resistance of conductor a 0°C is 10Ω. When its temp is increased to 50°C, the new resistance is ($\alpha$ = 0.007/°C)
a) 12Ω b) 135Ω c) 13.5Ω d) 12.5Ω

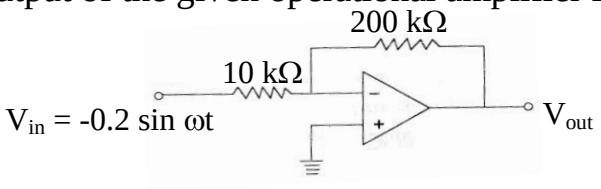
96. A toaster operating at 220 V has a resistance 110ΩΩ. The power is
a) 44W b) 440W c) 44KW d) 44W

97. The radius of first orbit of hydrogen atom 0.53A. The value of the radius of $4^{th}$ orbit
a) 4.774A b) 212A c) 59A d) 8.48A

98. The ratio of radii of first three orbits of hydrogen atom is
a) 1 : 8 : 27 b) 1 : 2 : 3 c) 1 : 4 : 9 d) 1 : 2 : 3

99. The charge of oil drop in the millikans oil drop method is $12.82 \times 10^{-19}$C. The number of electron stick with the oil drop is
a) 6 b) 2 c) 7 d) 8

100. The output of the given operational amplifier is




a) -2sin ωt b) 4 sin ωt c) -2 sin (ωt + 20°)

101. The polarising angle for water is 53°4'. If light is incident at this angle on the surfaces of water the angle between reflected and refracted rays is
a) 53°4' b) 106°8' c) 90° d) 36°56'

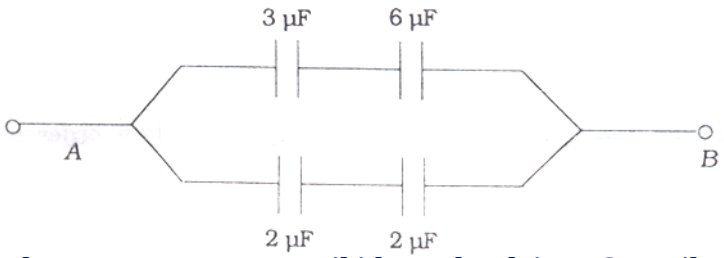
102. An element $_zX^A$ successively undergoes three α - decays and four β- decays and gets converted to an element Y. The mass number and atomic number of the element Y are respectively.
a) A – 12, Z – 2 b) A-12, Z+2 c) A-12, Z+4 d) A-8, Z +2

103. The momentum of the electron having wavelength 2 Å is
a) $3.3 \times 10^{24}$ kgms$^{-1}$ b) $6.6 \times 10^{24}$ kgms$^{-1}$
c) $3.3 \times 10^{-24}$ kgms$^{-1}$ d) $6.6 \times 10^{-24}$ kgms$^{-1}$

104. In a tangent galvanometer, for a constant current, the deflection is 30°. The plane of the coil is rotated through 180°. Now, for the same current, the deflection will be
a) 30° b) 60° c) 90° d) 0°

105. In step- up transformer the output voltage is 11 kV and the input voltage is 110 V. The ratio of number of turns of secondary to primary is
a) 20 : 1 b) 100 : 1 c) 50 : 1 d) 1 : 100

106. In the given circuit, the effective capacitance between A and B will be



a) 3μF b) 30μF c) 13μF d) 7μF

107. In a thermocouple, the temperature of the cold junction is 70°C, the neutral temperature is 300°C. The temperature of inversion is
a) 520°C b) 540°C c) 500°C d) 530°C

108. The capacitance of a parallel plate capacitor increases from 5 μF to 50 μF when a dielectric is filled between the plates. Then permittivity of the dielectric_____ $C^2 N^{-1} m^2$
a) $8.854 \times 10^{-11}$ b) $8.854 \times 10^{-12}$ c) 12 d) 10

109. If the radius of a nucleus is $2.6 \times 10^{-15}$ m, then its mass number will be
a) 2 b) 4 c) 8 d) 16

110. Potential energy of two equal but opposite point charges of magnitude 2 μC placed 1m apart in air is
a)2 J b) -0.036 J c)4 J d) 0.036 J

111. In LCR series a.c. circuit, the phase difference between current and voltage is 30°. The reactance of the circuit is 17.32 Ω. The value of resistance is
a)30 Ω b) 10 Ω c) 17.32 Ω d) 1.732 Ω

## TWISTED BOOK BACK QUESTIONS

## CHAPTER I

1. A ebonite rod acquires a charge of $-80 \times 10^{-12}$ C. The number of electrons it has gained or lost
**a) $50 \times 10^7$ (gained)** b) $5 \times 10^7$ (lost) c) $2 \times 10^{-8}$ (lost) d) $-8 \times 10^{-12}$ (lost)
2. The electrostatic force between two point charges kept at a distance d apart, in a medium εr = 9, is 3 N. The force between them at the same separation in vacuum is
a) 20 N b) 0.5 N c) 1.8 N **d) 27 N**
3. Electric potential is 400 V at a distance of 2m from a point charge. It will be 100 V at a distance of
a) 50 cm b) 4 cm c) 4 m **d) 8m**
4. Two point charges +4q and +q are placed 30 cm apart. At what point on the line joining them the electric field is zero ?
a) 15 cm from the charge q **b) 10 cm from the charge q**
c) 20 cm from the charge q d) 5 cm from the charge q
5. A dipole is placed in a non-uniform electric field to the field. It experiences,
a) only a net force b) only a torque
**c) both a net force and torque** d) neither a net force nor a torque
6. If a point lies at a distance x from the midpoint of the dipole, the electric field at this point is proportional to
a) $\frac{1}{x^2}$ **b) $\frac{1}{x^3}$** c) $\frac{1}{x^4}$ d) $\frac{1}{x^{3/2}}$
7. Four charges +q, -q, +q and - q respectively are placed at the corners A, B, C and D of a square of side a. The electric field at the centre O of the square is

a) $\frac{1}{4\pi\varepsilon_0}\frac{q}{a}$ b) $\frac{1}{4\pi\varepsilon_0}\frac{2q}{a}$ c) $\frac{1}{4\pi\varepsilon_0}\frac{4q}{a}$ **d) zero**

8. Electric potential Energy (U) of a dipole in a field is
   a) $q_1q_2 / 4\pi\varepsilon_o r^2$ b) $q_1q_2 / 4\pi\varepsilon_o r$ **c) - pE cosθ** d) pE sinθ
9. The work done in moving 500 μC charge between two points on different equipotential surfaces is
   a) zero **b) finite positive** c) finite negative d) infinite
10. Which of the following quantities is not a scalar?
   a) Electric potential energy **b) electric force**
   c) workdone d) electric potential
11. The unit of relative permittivity is
   **a) $C^2 N^{-1} m^{-2}$** b) $N m^2 C^{-2}$ **c) no unit** d) $NC^{-2} m^{-2}$
12. The number of electric lines of force originating from a charge of -1 C is
   a) $1.129 \times 10^{11}$ b) $1.6 \times 10^{-19}$ c) $6.25 \times 10^{18}$ d) **$-1.129 \times 10^{11}$**
13. The electric field inside the plates of two oppositely charged plane sheets of charge density σ is
   a) $\frac{+\sigma}{2\varepsilon_0}$ b) $\frac{-\sigma}{2\varepsilon_0}$ c) $\frac{\sigma}{\varepsilon_0}$ **d) zero**
14. The capacitance of a parallel plate capacitor increases from 6 μf to 60μf when a dielectric is filled between the plates. The dielectric constant of the dielectric is
   a) 65 b) 55 c) 12 **d) 10**
15. A hollow metal ball carrying an electric charge produces electric field at points
   a) outside the sphere b) on its surface
   c) inside the sphere **d) both (a) and(b)**

## CHAPTER-2

16. A charge of 120 C passes through an electric lamp in 2 minutes. Then the current in the lamp is
   a) 30 A **b) 1 A** c) 0.5 A d) 5 A
17. The material through which electric charge can notflow easily is
   a) Aluminium **b) mica** c) Iron d) copper
18. The current density flowing in a conductor is proportional to
   a) drift velocity **b) 1/area of cross section**
   c) 1/no of electrons d) square of area of cross section
19. A toaster operating at 240 V has a resistance of 120Ω. The current is
   a) 400 A **b) 2 A** c) 480 A d) 240 A
20. If the length of a copper wire has a certain resistance R, then on doubling the length its resistance
   **a) will be doubled** b) will become $1/4^{th}$
   c) will become 4 times d) will remain the same
21. When two 4Ω resistances are in parallel, the effective resistance is
   **a) 2 Ω** b) 4 Ω c) 1 Ω d) 0.5 Ω
22. In the case of semi conductors, as the temperature increases, resistivity
   **a) decreases** b) increases
   c) remains constant d) becomes zero

23.If the resistance of a coil is 1Ω at 0°C and α = 0.004 / °C, then its resistance at 100°C is

a)0Ω **b) 1.4 Ω** c) 4 Ω d) 2.8 Ω

24.According to Faraday's law of electrolysis, when a current is passed, the mass of ions deposited at the cathode is dependent of

a) current b) charge c)resistance **d) both (a) and(b)**

25.When n resistors of equal resistances (R) are connected in parallel, the effective resistance is

a) n/R **b) R/n** c) 1/nR d) nR

## CHAPTER-3

26.Joule's law of heating is

a) $H = I^2 t / R$ **b) $H = V^2 t/R$** c) H = VI/t d) $H = IR^2 t$

27.Nichrome wire is used as the heating element because it has

a) low specific resistance

b) high melting point

c) high specific resistance

**d) both (a) and(b)**

28.Peltier coefficient at a junction of a thermocouple depends on

a) the current in the thermocouple

b) the time for which current flows

**c) the temperature of the junction**

d) the charge that passes through the thermocouple

29.In a thermocouple, the temperature of the cold junction is 20°C, The temperature of inversion is 540°C, the neutral temperature is

a) 520°C **b) 280°C** c) 500°C d) 510°C

30.Which of the following equations represents Biot - Savert law?

a) $dB = \frac{\mu_0}{4\pi}\frac{I\,dl}{r^2}$ **b) $dB = \frac{\mu_0}{4\pi}\frac{I\,dl\sin\theta}{r^2}$**

c) $\overrightarrow{dB} = \frac{\mu_0}{4\pi}\frac{I\,dl \times \overline{r}}{r^2}$ d) $\overrightarrow{dB} = \frac{\mu_0}{4\pi}\frac{I\,dl \times \overline{r}}{r^3}$

31.Magnetic induction due to an infinitely long straight conductor placed in air or vacuum is

a) $\frac{\mu_0 I}{4\pi a}$ **b) $\frac{\mu_0 I}{2\pi a}$** c) $\frac{\mu I}{4\pi a}$ d) $\frac{\mu I}{2\pi a}$

32.In a tangent galvanometer, for a constant current, the deflection is 30°. The plane of the coil is rotated through 180°. Now for the same current, the deflection will be

**a) 30°** b) 60° c) 90° d) 0°

33.The period of revolution of a charged particle inside a cyclotron depends on

a) the magnetic induction b) the charge of the particle

c) the mass of the particle **d) all of these**

34. The torque on a rectangular coil placed in a uniform magnetic field is zero, when

a) the number of turns is large

b) the number of turns is less
**c) the plane of the coil is perpendicular to the field**
d) the area of the coil is small

35. Phosphor - bronze wire is used for suspension in a moving coil galvanometer, because it has
a) high conductivity b) high resistivity
c) large couple per unit twist **d) small couple per unit twist**

36. Of the following devices, which has large resistance?
a) moving coil galvanometer b) ammeter of range 0 - 1A
c) ammeter of range 0 - 10 A **d) voltmeter**

37. A galvanometer of resistance G Ω is connected with resistor of RΩ. The effective resistance of the combination is $R_v$. Then, which of the following statements is true?
a) G is greater than R **b) $R_v$ is greater than R and G**
c) $R_v$ is less than both G and R d) R is less than both G and $R_v$

38. An ideal ammeter has
a) finite resistance less than G but greater than zero
b) **zero resistance**
c) resistance greater than G but less than infinity
d) infinite resistance

## CHAPTER-4

39. Electromagnetic induction is used in
**a) transformer b)** room heater c) toaster d) galvanometer

40. A coil of area of cross section 0.5 $m^2$ with 10 turns is in a plane which is parallel to an uniform magnetic field of 0.2 Wb / $m^2$. The flux through the coil is
a) 100 Wb b) 10 Wb c) 1 Wb **d) zero**

41. Kirchoff's I law is in accordance with the law of
**a) conservation of charges** b) conservation of flux
c) conservation of momentum d) conservation of energy

42. The mutual - inductance of a pair of coils which are perpendicular is
**a) zero** b) infinity c) very large d) very small

43. The unit Henry can also be written as
**a) Vs $A^{-1}$** b) $Wb^{-1}$ A c) $\Omega S^{-1}$ d) all

44. An emf of 40 V is induced when the current in the coil changes at the rate of 10 A $S^{-1}$. The coefficient of self induction of the coil is
a) 0.3 H b) 0.003 H **c) 4 H** d) 4.8 H

45. An AC of peak value of 5A produces the same heating effect as an DC of
a) 50 A rms current **b) 3.53 A** c) 5A rms current d) 7.07

46. Choke coil works on
**a) AC only** b) DC only
c) both AC and DC d) AC more effectively than DC

47. The part of the AC generator that passes the current from the coil to the external circuit is
a) field magnet b) split rings c) slip rings **d) brushes**

48.In an AC circuit the applied emf $e = E_o \sin(\omega t + \pi/2)$ lags the current $I = I_o \sin(\omega t + \pi/2)$ by

a) $\pi/2$ b) $\pi/4$ c) $\pi$ **d) 0**

49.Which of the following canbe changed in a transformer?

a) output current b) output voltage

c) input power **d) both (a) and(b)**

50.The power loss is more in the transmission lines when

**a) voltage is less but current is more**

b) both voltage and current are more

c) voltage is more but current is less

d) both voltage and current are less

51.Which of the following devices allow d.c to pass through?

a) resistor b) capacitor c) inductor **d) both (a) and(c)**

52.In an ac circuit

**a) the average value of current is zero**

b) the average value of square of current is zero

c) the average power dissipation is zero

d) therms current is $\sqrt{2}$ time of peak current

## CHAPTER-5

53.In an electromagnetic wave

**a) Energy is equally divided for the electric and magnetic fields.**

b) power is transmitted in a direction parallel to both the fields

c) power is transmitted along electric field

d) power is transmitted along magnetic field

54.Sound waves are

a) transverse **b) longitudinal**

c) may be longitudinal or transverse d) neither longitudinal nor transverse

55.Refractive index of water is 4/3. Time taken for light to pass through a glass plate of thickness 9 cm is

a) $2 \times 10^{-8}$ s **b) $4 \times 10^{-10}$ s** c) $5 \times 10^{-8}$ s d) $5 \times 10^{-10}$ s

56.In an electromagnetic wave the angular difference between the plnes containing fields E and B is

a) $\pi/4$ **b) $\pi/2$** c) $\pi$ d) zero

57.Solar spectrum is a

a) pure line spectrum b) emission band spectrum

**c) absorption line spectrum** d) absorption band spectrum

58.When a drop of water is replaced by air between the glass plate and plano convex lens in Newton's rings system, the ring system

a) contracts **b) expands**

c) remains same d) first expands, then contracts

59.A beam of monochromatic light enters from water($\mu$) in to air. The ratio of the frequency of the incident and refracted waves is

a) $\mu : 1$ b) $1 : \mu$ **c) 1:1** d) $1 : \mu^2$

60. If the wavelength of the light is increased by four tmes , then the amount of scattering is
a) increased by 16 times
b) decreased by 16 times
c) increased by 256 times
**d) decreased by 256 times**

61. In Newton's ring experiment the radii of the $m^{th}$ and $(m + 2)^{th}$ dark rings are respectively $\sqrt{5}$ mm and $\sqrt{7}$ mm. What is the value of m ?
a) 2 **b) 5** c) 8 d) 10

62. The path difference between two monochromatic light waves of wavelength 4000Å is $3 \times 10^{-7}$ m. The phase difference between them is
a) $\pi$ b) $2\pi$ **c) $^{3\pi}/_{2}$** d) $^{\pi}/_{2}$

63. In Young's experiment, the third bright band for wavelength of light 8000Å coincides with the fourth bright band for another source in the same arrangement. The wave length of the another source is
a) 4500Å **b) 6000 Å** c) 5000 Å d) 4000 Å

64. A light of wavelength 5000Å is incident normally on a grating 0.005 m wide with 2500 lines. Then the maximum order is
a) 3 b) 2 c) 1 **d) 4**

65. A diffraction pattern is obtained using a beam of blue light. What happens if the blue light is replaced by red light?
a) bands disappear
b) no change
c) diffraction pattern becomes narrower and crowded together
**d) diffraction pattern becomes broader and farther arpat**

66. The refractive index of the glass, at the polarizing angle is
a) 1.732 b) 1.414 **c) 1.5** d) 1.468

## CHAPTER-6

67. The canal rays are
a) a stream of electrons **b) a stream of positive ions**
c) a stream of uncharged particles d) the same as cathode rays

68. A narrow electron beam passes undeviated through an electric field $E = 3 \times 10^4$ V/m and an overlapping magnetic field $B = 2 \times 10^{-3} Wb/m^2$. The electron motion, electric field and magnetic field are mutually perpendicular. The speed of the electron is
a) 60 $ms^{-1}$ b) $10.3 \times 10^7 ms^{-1}$ **c) $1.5 \times 10^7$ $ms^{-1}$** d) $0.67 \times 10^{-7}$ $ms^{-1}$

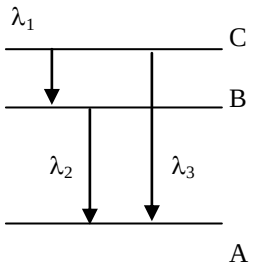
69. According to Bohr's postulates, which of the following quantities can't take discrete values?
a) kinetic energy b) potential energy
c) angular momentum d) both (a) and(b)

70. The ratio of the diametres of the first three Bohr orbit is,
a) 1 : 1/2 : 1/3 b) 1 : 2 : 3 **c) 1: 4 : 9** d) 1 : 8 : 27

71. The first excitation potential or the minimum potential required to excite the atom from ground state of hydrogen atom is
a) 13.6 eV b) 10.2 eV c) 3.4 eV **d) 10.2V**

72. According to Bohr atom model, the spectral lines emitted by an atom is,
**a) line spectrum** b) continuous spectrum
c) continuous absorption spectrum d) band spectrum

73. Energy levels A, B, C of a certain atom correspond to increasing values of energy (ie., ) $E_A < E_B < E_C$. If $\lambda_1$, $\lambda_2$, $\lambda_3$ are the wavelength of radiations corresponding to the transitions C to B, B to A and C to A respectively, which of the following statements is correct.




**a) $E_3 = E_1 + E_2$** b) $\lambda_3 = \frac{\lambda_1 + \lambda_2}{\lambda_1 \lambda_2}$ c) $\lambda_1 = \lambda_2 + \lambda_3 = 0$ d) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

74. The circular orbits of electron in the atom were proposed by
a) J.J.Thomson **b) Bohr** c) Sommerfeld d) de-Broglie

75. Pair production is a
a) phenomenon of conversion of kinetic energy into radiation
b) conversion of momentum
**c) conversion of energy into mass**
d) principle of conservation of charge

76. In an X - ray tube, the frequency of the emitted X - ray beam is increased by
a) increasing the filament current b) decreasing the filament current
**c) increasing the target potential** d) decreasing the target potential

77. The energy of a photon of continuous X - ray from a Coolidge tube comes from
a) the kinetic energy of the free electrons of the target
**b) the kinetic energy of fast moving electron**
c) the kinetic energy of the striking electron
d) an atomic transition in the target

78. A Coolidge tube operates at 49,600 V. The maximum frequency of X - ray radiation emitted from Coolidge tube is
a) $6 \times 10^{18}$ Hz **b) $12 \times 10^{18}$ Hz** c) $6 \times 10^{8}$ Hz d) $3 \times 10^{8}$ Hz

79. In hydrogen atom, which of the following transitions produce a spectral line of maximum frequency
a) $2 \rightarrow 1$ **b) $4 \rightarrow 1$** c) $6 \rightarrow 5$ d) $5 \rightarrow 2$

80. In hydrogen atom, which of the following transitions produce a spectral line of maximum wavelength
a) $2 \rightarrow 1$ **b) $6 \rightarrow 5$** c) $4 \rightarrow 3$ d) $5 \rightarrow 2$

81. Before pumping process in laser,

**a) number of atoms in the ground state is greater than the number of atoms in the excited state**
b) the number of atoms in the excited state is greater than the number of atoms in the ground state
c) the number of atoms in the ground state is equal to the number atoms in the excited state
d) no atoms are available in the excited state

82. The Xenon lamp on the ruby rod
a) absorbs red light b) absorbs green light
c) absorbs blue light **d) emits green light**

## CHAPTER – 7

83. A photon of frequency ν is incident on a metal surface of threshold frequency $\nu_0$. The kinetic energy of the emitted photoelectron is
a) $h(\nu + \nu_0)$ b) $h\nu$ c) $h\nu_0$ **d) $h(\nu - \nu_0)$**

84. The work function of a photoelectric material is 6.6 eV. The threshold frequency will be equal to
a) $8 \times 10^{14}$ Hz b) $8 \times 10^{10}$ Hz **c) $6 \times 10^{15}$ Hz** d) $4 \times 10^{14}$ Hz

85. The stopping potential of a metal surface is dependent of
a) frequency of incident radiation b) kinetic energy of electron
c) velocity of the electrons emitted **d) all of these**

86. At the threshold frequency, the velocity of the electrons is
**a) zero** b) maximum c) minimum d) infinite

87. The photoelectric effect can be explained on the basis of
a) corpuscular theory of light b) wave theory of light
c) electromagnetic theory of light d) quantum theory of light

88. The wavelength of the matter wave is independent of
a) mass b) velocity c) momentum d) charge

89. If the kinetic energy of the moving particle is E, then the de Broglie wavelength is
a) $\lambda = \frac{h}{\sqrt{2mE}}$ b) $\lambda = \frac{\sqrt{2mE}}{h}$ c) $\lambda = h\sqrt{2mE}$ d) $\lambda = \frac{h}{E\sqrt{2m}}$

90. The momentum of the electron having wavelength 2Å is
a) $3.3 \times 10^{24}$ kg m $s^{-1}$ b) $6.6 \times 10^{24}$ kg m $s^{-1}$
c) $3.3 \times 10^{-24}$ kg m $s^{-1}$ d) $6.6 \times 10^{-24}$ kg m $s^{-1}$

91. According to relativity, the length of a rod in motion
a) is same as its rest length
b) is more than its rest length
c) is less than its rest length
d) may be more or less than or equal to rest length depending on the speed of the rod

92. If 1 kg of a substance is fully converted into energy, then the energy produced is
a) $9 \times 10^{16}$ J b) $9 \times 10^{24}$ J c) 1J d) $3 \times 10^{8}$ J

## CHAPTER-8

93. The nuclear diameter of $_4Be^8$ nucleus is
a) $1.3 \times 10^{-15}$ m b) $2.6 \times 10^{-15}$ m c) $1.3 \times 10^{-13}$m **d) $5.2 \times 10^{-15}$ m**

94. The nuclei $_1H^1$ and $_1H^2$ are example of
**a) isotopes** b) isobars c) isotones d) isomers

95. The mass defect of a certain nucleus is found to be 0.01 amu. Its binding energy is
a) 27. 93 eV b) 27.93 KeV c) 27.93 MeV **d) 9.31MeV**

96. Nuclear fission can be explained by
a) shell model b) liquid drop model
c) quark model d) Bohr atom model

97. The orbiting electrons around the nucleus are attracted by
a) gravitational force **b) electrostatic force**
c) nuclear force d) magnetic force

98. The ionization power is minimum for
a) neutrons b) α - particles **c) γ- rays** d) β - particles

99. The half life period of a certain radioactive element with disintegration constant 0.00693 per day is
a) 10 days b) 14 days **c) 100 days** d) 1.4 days

100. The radio- isotope used in medical field is
a) $P^{31}$ b) $P^{32}$ c) $Na^{23}$ **d) $Na^{24}$**

101. The average energy released per fission is
a) 200eV b) 200 J c) 200 meV d) **) $3.2 \times 10^{-11}$ J**

102. The explosion of hydrogen bomb is based on the principle of
a) uncontrolled fission reaction b) controlled fission reaction
c) controlled chain reeaction **d) thermonuclear reaction**

103. Brain tumours can be diagnosed by
a) $P^{31}$ b) $P^{32}$ c) $Fe^{59}$ **d) $I^{131}$**

104. In the nuclear reaction $_{80}Hg^{198} + X \rightarrow _{79}Au^{198} + _1H^1$, X - stands for
a) proton b) electron **c) neutron** d) deutron

105. In γ- decay
a) atomic number decreases by one b) mass number decreases by one
c) proton number remains the same **d) change in energy level only**

106. Isotones have
a) same mass number but different atomic number
b) same proton number and neutron number
c) same proton number but different neutron number
**d) same neutron number but different proton number**

107. The time taken by the radioactive element to reduce to $1/e^2$ times is
a) half life b) mean life c) half life/2 d**) twice the mean life**

108. The half life period of $N^{13}$ is 10.1 minute. Its mean life time is
a) 5.05 minutes b) 20.2 minutes **c) $\frac{10.1}{0.6931}$minutes** d) infinity

109. Positive rays of the same element produce same traces in a Bainbridge mass spectrometer. The positive ions have
a) same mass with different velocity **b) same mass with same velocity**
c) different mass with same velocity d) different mass with different velocity

110. The binding energy per nucleon of $_{26}Fe^{56}$ nucleus is
**a) 8.8 MeV** b) 88 MeV c) 493 MeV d) 41.3 MeV

111. The ratio between the nuclear densities of mercury and gold is
a) $1.3 \times 10^{10} : 5.2 \times 10^{10}$ b) 1:3
c) $1.3 \times 10^{13} : 1$ **d) 1:1**

## CHAPTER-9

112. The electrons in the atom of an element which does not determine its chemical and electrical properties are called
a) valence electrons **b) core electrons**
c) excess electrons d) active electrons

113. In an P - type semiconductor, there are
**a) immobile negative ions** b) no minority carriers
c) immobile positive ions d) holes as majority carriers

114. The forward current in a PN junction diode is only due to
a) majority carriers b) minority carriers
c) acceptor ions d) donor ions

115. In the reverse bias characteristics curve, a diode appears as
a) a high resistance b) a capacitor **c) an OFF switch** d) an ON switch

116. Breakdown mechanism is based on the phenomenon of
**a) collision** b) ionization c) doping d) recombination

117. The intensity of light emitted by a LED depends on
a) its reverse bias **b) the amount of forward current**
c) its forward bias d) type of semiconductor material

118. The emitter base junction of a given transistor is forward biased and its collector - base junction is reverse biased. If the base current is decreased, then its
a) $V_{CE}$ will increase **b) $I_C$ will decrease**
c) $I_C$ will increase d) $V_{CC}$ will increase

119. Proper biasing of a transistor means
a) heavy loading of emitter current b) distortion in the output signal
c) excessive heat at collector terminal **d) selecting Q point correctly**

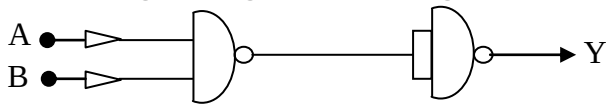
120. A tank circuit in an oscillator is
a) an amplifier with feedback **b) a convertor of dc to ac energy**
c) nothing but an amplifier d) an amplifier without feedback

121. In a Colpitt's oscillator circuit
a) **capacitive feedback is used** b) tapped coil is used
c) no tuned LC circuit is used d) no capacitor is used

122. The input impedance of an ideal operational amplifier is infinite, then
a) its input current is zero
**b) its output impedance is zero**
c) its output voltage becomes independent of load resistance

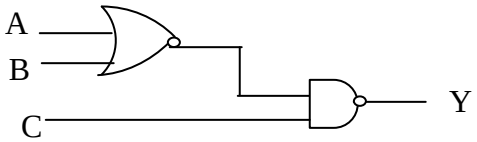
d) it becomes a current controlled device

123. The output of following arrangement of logic function is




a) A . B  b) A + B  **c) $\bar{A}$ . $\bar{B}$**  d) A + $\bar{B}$

124. If the output (Y) of the following circuit is 0, the inputs A B C must be




a) 0 1 0  b) 1 0 0  **c)0 0 1**  d)1 1 0

125. According to the laws of Boolean algebra, the expression (A + B).(A+C) is equal to

a) A.B.C  b) A+BC  c) AB + BC + CA  d) $\bar{A}$(B+C)

126. The Boolean expression $\overline{A + B + C}$ can be simplified as

a) AB + $\bar{C}$  b) $\bar{A}$ . $\bar{B}$ . $\bar{C}$  c) AB + BC + CA  d) $\bar{A}$ + $\bar{B}$ + $\bar{C}$

## CHAPTER – 10

127. Medium and long waves follow

**a) the ground wave propagation**  b) the line of sight direction
c) ionospheric propagation  d) the curvature of the earth

128. The main purpose of using Buffer is

a) combine two waves of different frequencies
b)acquire wave shaping of the carrier wave
c) transmit low frequency information over long distance efficiently
**d) provide isolation between two stages**

129. In FM modulation

a) the amplitude of the carrier wave varies in accordance with the amplitude of the modulating signal.
b) the amplitude of the carrier wave remains constant
**c) the frequency of the carrier varies in accordance with the amplitude of the modulating signal**
d) modulating frequency lies in the audio range

130. In FM , the carrier swing is

**a) twice the frequency deviation**  b) twice the signal frequency
c)thrice the signal frequency  d) four times the signal frequency

131. In amplitude modulation

a) only the phase of the carrier wave varies
**b) only the amplitude of the carrier wave varies**
c) both the phase and the frequency of the carrier wave varies
d) there is no change in the frequency and phase of the carrier wave

132. The AF channel in a radio transmitter produces
**a) audio signals**
b) high frequency carrier waves
c) both audio signal and high frequency carrier waves
d) low frequency carrier waves

133. The purpose of dividing each frame into two fields in interlaced scanning is
a)to avoid unwanted noises in the signals
b) the fact that handling of higher frequencies is easier
c) that 50 Hz is the power line frequency in India
**d) does not increase the channel width**

134. Printed documents to be transmitted by fax are converted into electrical signals by the process of
a) reflection b) scanning c) modulation d) light variation



**ANSWER KEY**
**"ANGLE" ORIENTED**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| A | B | B | C | C | B | B | C | A | A | B | A | A | C | A |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| C | A | C | B | C | B | C | B | B | D | A | B | C | C | C |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** |
| C | D | A | B | B | C | B | B | D | B | C | D | A | A | B |
| **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | |
| A | A | C | B | C | B | C | B | B | C | C | A | C | A | |

**'INCREASES – DECREASES' RELATED**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| B | A | C | A | C | C | D | A | D | C | A | C | D | D | B |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| A | D | D | C | C | B | C | D | A | C | A | B | C | A | D |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D | C | C | C | D | B | D | D | D | D | C | C | C | B | A |
| **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | **60** |
| D | C | D | A | C | B | B | B | B | C | D | C | D | B | A |
| **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | | | | | |
| C | C | A | B | A | A | B | C | A | B | | | | | |

**GENERAL**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| C | A | A | C | B | C | B | D | A | C | C | D | D | C | A |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| B | C | B | B | A | B | C | C | A | D | A | B | C | D | C |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | | | |
| C | B | D | A | D | C | D | A | A | A | C | D | | | |

**FORMULA ORIENTED**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| C | B | A | D | C | A | B | D | D | C | D | D | D | B | D |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| B | D | C | C | D | D | C | D | D | D | C | C | D | C | D |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** |
| D | C | D | D | D | C | D | D | A | C | C | A | C | B | D |
| **46** | **47** | **48** | **49** | **50** | **51** | **52** | | | | | | | | |
| D | C | D | B | C | B | B | | | | | | | | |

**PROBLEM ORIENTED ONE MARK**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| C | D | A | C | C | C | A | B | C | A | D | A | C | B | C |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| B | D | D | A | B | A | B | B | C | C | D | A | B | A | C |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** |
| A | B | B | B | B | A | B | B | A | D | C | C | B | B | B |
| **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | **60** |
| D | C | C | C | D | D | B | B | C | A | B | A | B | C | B |
| **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | **71** | **72** | **73** | **74** | **75** |
| B | C | D | D | D | B | D | C | B | C | C | B | A | B | A |
| **76** | **77** | **78** | **79** | **80** | **81** | **82** | **83** | **84** | **85** | **86** | **87** | **88** | **89** | **90** |
| D | A | C | C | C | A | B | A | C | A | A | A | A | B | A |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **91** | **92** | **93** | **94** | **95** | **96** | **97** | **98** | **99** | **100** | **101** | **102** | **103** | **104** | **105** |
| C | B | D | B | C | B | D | C | D | B | C | A | C | A | B |
| **106** | **107** | **108** | **109** | **110** | **111** | | | | | | | | | |
| **A** | **D** | **A** | **C** | **B** | **A** | | | | | | | | | |

**TWISTED BOOK BACK**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| A | D | D | B | C | B | D | C | B | B | A | D | D | D | D |
| **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** |
| B | B | B | B | A | A | A | B | D | B | B | D | C | B | B |
| **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** |
| B | A | D | C | D | D | B | B | A | D | A | A | A | C | B |
| **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | **60** |
| A | D | D | D | A | D | A | A | B | B | B | C | B | C | D |
| **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | **71** | **72** | **73** | **74** | **75** |
| B | C | B | D | D | C | B | C | D | C | D | A | A | B | C |
| **76** | **77** | **78** | **79** | **80** | **81** | **82** | **83** | **84** | **85** | **86** | **87** | **88** | **89** | **90** |
| C | B | B | B | B | A | D | D | C | D | A | D | D | A | D |
| **91** | **92** | **93** | **94** | **95** | **96** | **97** | **98** | **99** | **100** | **101** | **102** | **103** | **104** | **105** |
| B | B | D | A | D | B | B | C | C | D | D | D | D | C | D |
| **106** | **107** | **108** | **109** | **110** | **111** | **112** | **113** | **114** | **115** | **116** | **117** | **118** | **119** | **120** |
| D | D | C | B | A | D | B | A | A | C | A | B | B | D | B |
| **121** | **122** | **123** | **124** | **125** | **126** | **127** | **128** | **129** | **130** | **131** | **132** | **133** | **134** | |
| A | B | C | C | B | B | A | D | C | A | B | A | D | B | |



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PRIT-EDUCATION.