ADHARSH VIDHYALAYA MATRIC HIGHER SECONDARY SCHOOL

Std: XII | Physics One Mark | Date: 18-03-2023

1. The number of electrical lines of forces produced by 5 C of charge in vacuum is
a) $36\pi \times 10^9$ b) $18\pi \times 10^4$ c) 565.5×10^9 d) 8.85×10^{12}

2. When an earthened conductor moves towards a charged conductor the potential of the charged conductor.
a) becomes zero b) Increases c) decreases d) remains same

3. Two point charges placed of a distance r in the air experience a certain force then the distance at which they will experience the same force in the medium of dielectric constant k is
a) kr b) r/2 c) r/√k d) r

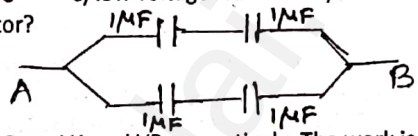
4. The electric field intensity at any point outside two equal and same charged infinite plane parallel sheets is,
a) $\sigma/2\varepsilon_o$ b) σ/ε_o c) 0 d) $2\sigma/\varepsilon_o$

5. Two parallel plates with 5 cm separation are at potential difference of 0.5 kv force acting on the electron between the plates is
a) 4.6×10^{-5} N b) 3.6×10^{-15} N c) 2.6×10^{-5} N d) 1.6×10^{-15} N

6. Charge density of the circular shape of the conductor is
a) negative b) zero c) equal d) maximum

7. Vande Graft generator produces potential difference of the order of
a) high voltage AC b) high voltage DC c) low voltage AC d) Low voltage DC

8. Calculate effective capacitance of capacitor?
a)1 μF b) 2 μF
c) 3 μF d) 4μF



9. The electric potential at the points A and B are VA and VB respectively. The work is done to moving an electron from A to B then.
a) VA > VB b) VA = VB c) VA < VB d) VA ≥VB

10. Two charges, Q1 = 4C and Q2 = - 5C are separated by a distance of 3m and experience a force of 2.0×10^{10} N. If the force must be zero.
a) 5C charge is given to Q2 b) 4C charge is given to Q1
c) -4C charge is given to Q1 d) (a) and (c)

11. The drift velocity of electron is proportional to
a) 1/charge of the electrons b) mass of the electron
c) the electric field intensity d) all the above

12. A thermistor is
a) conductor b) insulator c) semiconductor d) superconductor

13. A uniform wire of resistance R and length L is cut into 4 equal parts connected in parallel. The effective resistance of the combination will be
a) 4 R b) R/16 c) R d) R/4

14. Ampere second is a stands for the unit of
a) power b) energy c) e.m.f. d) charge

15. Wheatstone bridge is most sensitive when the ratio of arm is
a) equal to 1 b) equal to 10 c) of any value d) both a and b are true

16. N identical cells each of emf E and internal resistance r and joined in series to form a closed circuit. The potential difference across any one cell is V.
a) v = zero b) v = E c) v = E/N d) v = (N)E

17. On increasing the temperature the resistance will decreases for
a) platinum b) carbon c) manganin d) constantan

18. If the diameter (D) of a copper wire has a certain resistance R, then on doubling on diameter its conductance
a) will be doubled b) will become 1/4 th c) will become 4 times d) will remain the same

19. The ratio of electric potential at points 10 cm and 20 cm from the centre of an electric dipole along its axial line is
a) 1:2 b) 2:1 c) 1:4 d) 4:1

20. A ray of light travelling in a rarer medium and reflected at the surface of a denser medium automatically undergoes a
a) phase change of π/2 b) phase change of 2π
(c) path difference of π d) path difference of π/2

21. Magnetic field at a point on one end of the solenoid is given by
a) $B = \mu_o n I$ b) B = O c) B = 1/2 μon I d) μoNI/4a

22. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is
a) towards north b) towards south c) toward east d) toward west

23. A charged particle moves with velocity in a uniform magnetic field . The magnetic force experienced by the particle is
a) always zero b) never zero
c) zero, if B and v are perpendicular d) zero, if B and v are parallel

24. A current carrying loop is placed in a uniform magnetic field the torque acting on it does not depend upon
a) shape of the loop b) size of the loop c) value of the current d) magnetic field

25. A dueterium nucleus consists of one proton and one neutron. If a duetrium nucleus and a helium nucleus are both placed in the same electrifield, the acceleration of deuterium is
a) equal to that of the helium b) greater than that of helium
c) less than that of helium d) not related in a fixed way to that of helium

26. A charged particle of charge q and mass m enters perpendiuclar in a magneticfield . Kinetic energy of the particle is E. Then frequency of rotation is
a) 2πm /Bq b) qB/2πm c) qBE/2πm d) qB/2πE

27. A uniform magnetic field is obtained in
a) a bar magnet b) a horse shoe magnet
c) a circular coil carrying a current d) a cylindrical coil carrying a current

28. A 2 MeV proton is moving perpendicular to a uniform magnetic field of 2.5 tesla. The force on the proton is
a) 2.5×10^{-10} N b) 7.84×10^{-11}N c) 2.5×6^{-11} N d) 7.84×10^{-12} N

29. In a series LCR circuit at resonance the current value is decided by
a) capacitor b) inductor c) resistor d) all the three

30. An AC electric main line is denoted by 220 V, 5A. What do they indicate?
a) Peak value b) RMS value c) Instantaneous value d)mean square value

31. Large eddy currents are not used in
a) galvanometer damping b) speedometer c) induction furnace d) transformer

32. The strength of current produced in a generator is
a) directly proportional to the speed of revolution of armature
b) inversely proportional to the speed of revolution of armature
c) inversely proportional to the magnetic field
d) inversely proportional to the area of coil.

33. Commercially electric power is generated by the method of
a) chemical action b) thermo couple c) electromagnetic induction d) photo electric effect.

34. According to flemming Right hand rule
a) Mechanical energy convert into Electric Energy
b) Electrical energy convert into Mechanical Energy
c) Mechanical energy convert into Magnetic energy
d) Megnetic energy convert into mechanical energy

35. In a uniform magnetic field, the coil rotated through 270°. then the magnitude of induced emf is
a) 1736 E_o b) 1.736 E_o c) 0.1736 E_o d) zero

36. In a transformer, a primary coil has 100 turns and secondary coil having 100 turns if 110V AC input voltage connected to the transformer then the output voltage
a) does not change b) increases
c) decreases d) above condition does not possible in transformer.

37. In an LCR circuit when XL > XC, the expression for current is $I = I_o \sin(\omega t - \pi/2)$ then the expression for emf is
a) $e = E_o \sin\omega t$ b) $e = E_o \sin(\omega t + \pi/2)$ c) $e = E_o \sin(\omega t - \pi/2)$ d) $e = E_o \sin(\omega t - 2\pi)$

38. The change in magnetic field with time at a point produces a
a) Magnetic force b) Electric field c) Magentic flux d) Potential difference

39. The electromagnetic waves which are used to study the structure of nucleus are
a) Infra red rays b) microwaves c) ultra violet rays d) gamma rays

40. If S_1, S_2 are the rate of scattering of two light rays, then their wavelength ratio is
a) $S_1/S_2=(\lambda_1/\lambda_2)^4$ b) $S_1/S_2=(\lambda_2/\lambda_1)^4$ c) $S_1/S_2=(\lambda_1/\lambda_2)^{1/4}$ d) $S_1/S_2=(\lambda_2/\lambda_1)^{1/4}$

41. Which property of light could not be changed when reflection, refraction of light occurs?
a) Velocity b) frequency c) wavelength d) all these

42. Calcium or Barium salts in a bunsen flame gives out.
a) band spectra b) line spectra c) continuous spectra d) line absorption spectra

43. If an electromagnetic wave is propagating along x direction and electric field variation is along y-direction the magnetic field variation will be.
a) along x direction b) inclined at an angle of 45° with x direction.
c) along y direction d) along z direction

44. Diffraction effect is pronounced more in sound than in light, because.
a) wavelength of sound is low b) wave length of light is low
c) velocity of sound is low d) velocity of light is high

45. If, one of the slits in youngs double slit experiment is covered then
a) the fringes on the screen disappear b) Intensity of fringes increases
c) Intensity of fringe decreases
d) the fringes disappear and there is uniform illumination on the screen.

46. When a light is allowed to pass through an analyser and rotate the analyser from 0° to 90° as if intensity of out coming rays varies from maximum to minimum then the ray is
a) an ordinary ray b) a plane polarised ray
c) a partially plane polarised ray d) none of these.

47. Complementary effect of seeback effect is .....
a) Peltier effect b) Thomson effect c) Joule effect d) negative Thomson effect

48. Electric filament lamp is working on the basis of
a) Joules heating effect b) Peltier effect c) Thomson effect d) Seebec effect

49. An example for a conductor with negative Thomson effect is .....
a) silver b) Zinc c) cadmium d) mercury

50. Direction of a force acting on a current carrying conductor placed in a magnetic field is given by
a) Fleming left hand rule b) Fleming right hand rule
c) end rule d) Ampere circuital law

51. The unit of the number of electric lines of force passing through a given area is
a) no unit b) NC^{-1} c) Nm^2C^{-1} d) Nm

52. Transformer works on .....
a) AC only b) DC only c) both AC and DC d) AC more effectively than DC

53. Lenzs law is in accordance with law of conservation of .....
a) charges b) momentum c) mass d) energy

54. The equation of a 25 cycle current sine wave having rms value of 30A is
a) 30 sin 157 t b) 30 sin 150 t c) 42.42sin 157 t d) 42.42 sin 160 t

55. A wire cuts across a flux of 0.2×10^{-2} weber 0.12 second. What is the emf induced in the wire?
a) 0.06 V b) 0.02 V c) 0.0167 V d) 0.24 V

56. The resonant frequency of RLC circuit is γ_o. The inductance is doubled. The capacitance is also doubled. Now the resonant frequency of the circuit is
a) $2\gamma_o$ b) $\gamma_o / 2$ c) $\gamma_o /4$ d) $\gamma_o /\sqrt{2}$

57. Photoelectric current depends upon .....
a) intensity of incident light b) frequency of incident light
c) the potential difference between two plates d) all the above.

58. When the frequency of incident radiation increases the value of stopping potential .....
a) will decrease b) will increase c) remains the same d) will not increase

59. The momentum of electron having wavelength 2A° 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) 6.6×10^{-24} $kgms^{-1}$

60. Ratio of strength of nuclear force to that of gravitational force is
a) 10^{-40} b) 10^{-20} c) 10^{20} d) 10^{40}

61. 1 amu is equal to
a) 1.494×10^{-10} J b) 14.94×10^{-10} J c) 931 d) 931 eV

62. In a Forward biased junction diode, the voltage at which current starts to increase rapidly is known as
a) leakage voltage b) reverse saturation voltage c) knee- voltage d) cutoff voltage

63. In the photoelectric phenomenon if the ratio of the frequency of incident radiation incident on a photosensitive surface is 1:2:3 the ratio of the photoelectric current is
a) 1:2:3 b) 3:2:1 c) 1:4:9 d) 1:1:1

64. Essential conditions for the maintenance of oscillation is
a) $\beta = 1/A$ with positive feedback b) $\beta = 1/A$ with negative feedback
c) $\beta A = 1$ with positive feedback d) $1/\beta = A$ with negative feedback

65. When an electron jumps from M shell to the K shell it gives.
a) Kα line b) Kβ line c) Lα line d) Lβ line

66. In a transistor with $\beta = 40$, the base current is 25 μA. Then the collector current Ic is
a) 100 mA b) 1000 mA c) 1 mA d) 0.1 mA

67. Four dipoles of charges of magnitude +e and -e are placed inside a cube. The total electric flux coming out of the cube will be
a) $8e/\varepsilon_0$ b) $16e/\varepsilon_0$ c) e/ε_0 d) zero

68. If a point lies at a distance x from the mid point of the dipole, the electric potential at this point is proportional to .....
a) $1/x^2$ b) $1/x^3$ c) $1/x^4$ d) $1/x^{3/2}$

69. The magnitudes of three electric charges are 8 C, - 10 C, 2 C are brought in contact then the resultant charge of the body
a) 10 C b) 12 C c) 5 C d) 0

70. The capacitance of a parallel plate capacitor increases from 4 μF to 48 μF when a dielectric is filled between the plates. The dielectric constant of the dielectric is .....
a) 65 b) 55 c) 12 d) 10

71. An ideal volt meter has
a) zero resistance
b) finite resistance less than G but greater than zero
c) resistance greater than G but less than infinity
d) infinite resistance.

72. If a current carrying conductor is placed parallel to the magnetic field then the force acting on the conductor is .....
a) zero b) maximum c) BIL d) infinity

73. Transformer works on .....
a) AC only b) DC only c) both in AC and DC d) AC more effectively than DC

74. The power loss is less in 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.

75. The voltage rating of an alternating emf is 200 V, then the peak value of voltage is .....
a) 220 V b) 310 V c) 410 V d) 282.8V

76. In an LCR circuit if XL = XC
a) current is minimum & impedance is maximum
b) current is maximum & impedance is minimum
c) current and impedance are maximum
d) current and impedance are minimum

77. The wavelength range of visible light is
a) 8×10^{-7} m to 3×10^{-9} m b) 10^{-14} m to 10^{-10} m
c) 0.7×10^{-6}m to 0.375×10^{-6}m d) 6×10^{-10} m to 4×10^{-7} m

78. The wave front produced by the point source at finite distance is .....
a) spherical b) plane c) elliptical d) cylindrical

79. If the wavelength of the light is reduced to half the initial value, then the amount of scattering is
a) increased by 16 times b) decreased by 16 times
c) decreased by 256 times d) increased by 256 times

80. The ratio of velocity of light in air to the velocity of light in a medium is .....
a) disperssive power of the medium b) refractive index of air
c) refractive index of the medium d) none of the above.

81. 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. The electron motion, the electric field and magnetic field are mutually perpendicular. The speed of the electron is .....
a) 1.5×10^7 ms^{-1} b) $1.5 ms^{-1}$ c) 10^7 ms^{-1} d) 1.5×10^{-7} ms^{-1}

82. Energy levels A,B,C of certain atom corresponds to increasing (i.e) EA < EB < EC If λ1,λ2, λ3, are the wavelengths of radiations corresponding to the transistions C to B, B to A and C to A respectively, which of he following statements is correct?
a) $\lambda3 = \lambda1 + \lambda2$ b) $\lambda3 = \lambda1\lambda2 / (\lambda1 + \lambda2)$ c) $\lambda1 = \lambda2 + \lambda3$ d) $\lambda3 = (\lambda1+\lambda2/\lambda1\lambda2)$

83. maligant tumours to cure using
a) x rays b) cathode rays c) canal rays d) laser beam

84. A photon of frequency γ falls on a metal which has threshold frequency of γ_o, then the kinetic energy of the electron emitted is
a) $h(\gamma-\gamma_o)$ b) $h(\gamma+\gamma_o)$ c) $h(\gamma/\gamma_o)$ d) $h(\gamma_o/\gamma)$

85. Photo electric effect can be explained on the basis of .....
a) corpuscular theory of light b) wave theory of light
c) quantum theory of light d) electromagnetic theory of light

86. The mass defect of an atom is 0.03 amu, then the binding energy of the atom is .....
a) 23.79 MeV b) 29.73 MeV c) 2.793 MeV d) 27.93 MeV

87. The principle involved in atom bomb is .....
a) uncontrolled nuclear fission b) uncontrolled nuclear fusion
c) controlled nuclear fission d) both uncontrolled nuclear fission and fusion

88. Isotopes are the atoms .....
a) Which has same number of neutrons but different number of protons.
b) which has same number of protons but different number of neutrons
c) Which has equal number of protons and neutrons
d) which has same mass numbers.

89. In LED the colour of the light emitted depends on .....
a) current b) type of semi conductor c) potential difference d) resistance

90. The forbidden energy gap for germanium is .....
a) 10 eV b) 3 eV c) 0.7 eV d) 1.17 eV

91. The specific charge of cathode ray particle:
a) depends on nature of the cathode b) depends on the nature of the anode
c) depends on nature of gas atoms present inside discharge tube
d) independent of the above.

92. For the purpose of coupling the transmitter and the receiver to the space link, We use .....
a) amplifier b) oscillator c) Antennas d) FAX

93. In proton proton cycle four protons fuse together to give
a) an β particle, two electrons, two neutrinos and energy of 27 MeV
b) an γ particle, two positrons, two neutrinos and energy of 27 MeV
c) A helium atom, two positrons, two neutrinos and energy of 27 MeV
d) an α particle, two positrons, two antineutrinos and energy of 26.7 MeV

94. When the number of turns (n) in a galvanometer is doubled current sensitivity
a) remains constant b) decreases twice c) increases twice d) increases four times.

95. An electron is moving with a velocity of 3×10^6 ms^{-1} perpendicular to a uniform magnetic field of induction 0.5T . The force experienced by the electron is
a) 2.4×10^{-13}N b) 13.6×10^{-27}N c) 13.6×10^{-11} d) zero

96. The torque experienced by a rectangular current loop placed perpendicular to a uniform magnetic field is
a) maximum b) zero c) finite minimum d) infinity

97. In step-up transformer the output voltage is 11 kV and the input voltage is 220V. The ratio of number of turns of secondary to primary is
a) 20:1 b) 22:1 c) 50:1 d) 1:50

98. A rectangular coil is uniformly rotated in a uniform magnetic field such that the axis of rotation is perpendicular to the direction of the magnetic field. When the plane of the coil is perpendicular to the magnetic field.
a) i) magnetic flux is zero ii) induced e.m.f. is zero
b) i) magnetic flux is maximum ii) induced e.m.f. is maximum
c) i) magnetic flux is maximum, ii) induced e.m.f. is zero
d) i) magnetic flux is zero ii) induced e.m.f. is maximum

99. The energy of the electron in the first orbit of hydrogen atom is -13.6 eV. Its potential energy is
a)-13.6 eV b) 13.6 eV c) -27.2 eV d) 27.2 eV

100. If R is Rydberg constant, the shortest wavelength of Paschen series is
a) R/9 b) 9/R c) 16/R d) 25/R

STD : XII PHY. DES - ANS - KEY

Expt. No. Date :

Page No.

(1) $N = \frac{q}{\varepsilon_0} = \frac{5}{\frac{1}{4\pi \times 9 \times 10^9}} = 5 \times 4\pi \times 9 \times 10^9 = 565.5 \times 10^9$ (c)

(2) + + + | | ← V → decreases (c)

(3) $\frac{1}{4\pi\varepsilon_0}\frac{q^2}{r^2} = \frac{1}{4\pi\varepsilon_0 k}\frac{q^2}{r'^2}$

$k r'^2 = r^2 \Rightarrow r'^2 = \frac{r^2}{k}$

$r' = \frac{r}{\sqrt{k}}$ (c)

(4) + + + | | + + + $E = \frac{\sigma}{\varepsilon_0}$ out $E_{in} = 0$ (b)

(5) $E = \frac{V}{d} = \frac{0.5 \times 10^3}{5 \times 10^{-2}} = 10^4 \, Vm^{-1}$

$F = Eq = 10^4 \times 1.6 \times 10^{-19}$

$F = 1.6 \times 10^{-15} N$ (d)

(6) Equal (c)

(7) high voltage DC (b)

(8) 1μF 1μF A B 1μF 1μF ⇒ 0.5μF 0.5μF 1μF (a)

(9) $V_A > V_B$ (a)

(10) (a) and (c) (d)

(11) $V = \mu E$; $V_d \propto E$, $\mu = \frac{eZ}{m}$ (c)

(12) Semiconductor (bz α = -ve) (c)

(13) $R' = R/4$ Connected parallel.

$R_p = R'_n = \frac{(R/4)}{4} = \frac{R}{16}$ (b)

(14) $q = It \Rightarrow As$ (d)

(15) both a and b are true (d)

(16) $V = \frac{E}{N} \Rightarrow$ (c)

(17) Carbon (b)

(18) Conductance $\propto D^2$

$G' \propto D'^2$ $G' \propto (2D)^2$ $G' \propto 4D^2$

$G' = 4$ (c)

(19) $V = \frac{P\cos\theta}{4\pi\varepsilon_0 r^2}$ $V \propto \frac{1}{r^2}$ $\frac{V_1}{V_2} = \frac{r_2^2}{r_1^2} = \frac{4}{1}$ (d)

(20) phase change π (or) path diff $\frac{\lambda}{2}$ = (d)

(21) B due to Solenoid $\Rightarrow \mu_0 ni$

at one end $\Rightarrow \mu_0 ni\left(\frac{1}{2}\right) \Rightarrow \frac{1}{2}\mu_0 ni$ (c)

(22) N, W, E, S, I, B So, (a)

(23) $F = Bqv\sin\theta \Rightarrow B, v$ are ||

$F = 0$ (d)

(24) (b) size of the loop.

(25) $a = \frac{Ee}{m} \Rightarrow d = 1H^2$, $\propto \Rightarrow 2He^4$

$a_d = 2a_\alpha \Rightarrow$ So (b)

(26) $r = qB/2\pi mn$ (b)

(27) (coil) → B = uniform, I

(28) $\frac{1}{2}mv^2 = 2Mev = 2 \times 1.6 \times 10^{-13} J$

$r^2 = \frac{2 \times 2 \times 1.6 \times 10^{-13}}{M} = \frac{4 \times 1.6 \times 10^{-13}}{1.66 \times 10^{-27}}$

$v = \frac{6.4 \times 10^{+14}}{1.6}$

$F = Bqv$ $v = 2 \times 10^7 m/s$.

$= 2.5 \times 1.6 \times 10^{-19} \times 2 \times 10^7 \Rightarrow 8 \times 10^{-11} N$

(b) $7.84 \times 10^{-11} N$

(29) resistor ($X_L = X_C$ at resonance) (c)

(30) 220V, 5A → ac circuit V_{rms}, I_{rms} (b)

31) transformer (d)

32) $\mathcal{E} = \mathcal{E}_0 \sin\omega t$

$\omega = 2\pi\nu$

$\mathcal{E} \Rightarrow \mathcal{E}_0 \sin 2\pi\nu t$

$\mathcal{E} \Rightarrow \nu$ (a)

33) (c) EMI

34) (a)

35) $\mathcal{E} = \mathcal{E}_0 \sin\omega t$

$\omega t = 270°$

$\mathcal{E} = \mathcal{E}_0 \sin 270°$

$\mathcal{E} = \mathcal{E}_0 (0.1736)$

36) (d)

37) RLC circuit $X_L > X_C$

$E = E_0 \sin(\omega t + \pi/2)$ (b)

38) (b) Electric field

39) (d) gamma rays.

40) $\frac{S_1}{S_2} = \left(\frac{\lambda_2}{\lambda_1}\right)^4$ (d)

41) (b) frequency

42) (a) band spectra.

43) (c) along y direction

44) (c) velocity sound is low.

45) (a) the fringes on the screen disappear

46) (b) a plane polarised ray

47) (a) peltier

48) (a) Soule's law of heating

49) (d) mercury (+ve)

Silver, Zn, Cd → (+ve)

50) a) Fleming's left hand rule.

51) electronic flux

(c) $N m^2 C^{-1}$

52) a) ac only

53) (d) energy

54) $i = I_0 \sin\omega t$

$i_{rms} = \frac{I_0}{\sqrt{2}}$ $I_0 = i_{rms}\sqrt{2}$

$= 30 \times \sqrt{2}$

$I_0 = 42.42$

$i = 42.42 \sin 2\pi \times 25 \times t$

$= 42.42 \sin 50\pi t$

$i = 42.42 \sin 157 t$ (c)

55) $\phi = 0.2 \times 10^{-2}$ Wb $t = 0.12$ s

$\mathcal{E} = \frac{d\phi}{dt} = \frac{0.2 \times 10^{-2}}{0.12}$

(c) $= 1.66 \times 10^{-2}$

$\mathcal{E} = 0.016$ V

56) $\nu_0 = \frac{1}{2\pi\sqrt{LC}}$

$\nu_0' = \frac{1}{2\pi\sqrt{2L \cdot 2C}} = \frac{\nu_0}{2}$

$\nu_0' = \frac{\nu_0}{2}$ (b)

57)

57 (d) all the above

58. $V_0 \propto \gamma$ so (b) will increase

59. $\lambda = 2\,A^\circ$ $\lambda = \frac{h}{p} \Rightarrow p = \frac{h}{\lambda} = 3.3 \times 10^{-24}\ kg\ ms^{-1}$ (c)

60. $F_N = 10^{40} F_g$ $\frac{F_N}{F_g} = 10^{40}$ (d)

61 1 amu $\Rightarrow$ 931 Mev $= 931 \times 10^6 \times 1.6 \times 10^{-19} = 1.494 \times 10^{-10}$ J (a)

62 (c) knee voltage.

63. $\gamma_1 = \gamma_2 : \gamma_3 = I_1 : I_2 : I_3 \Rightarrow 1:1:1$ (d) intensity $\propto$ current Not in γ

64. $\beta A = 1$ positive feedback (c)

65 M shell to K shell $\Rightarrow K_\beta$ line

66 $\beta = 40$ $I_B = 25\,\mu A$ $I_c = ?$

$\beta = \frac{I_C}{I_B} \Rightarrow I_C = \beta I_B = 40 \times 25 \times 10^{-6} = 1000 \times 10^{-6} = 10^{-3}\,A$ (c) 1mA

67. dipole placed in cube $\Rightarrow$ Net charge zero so $\phi = 0$ (d)

68. $V = \frac{P\cos\theta}{4\pi\varepsilon_0 r^2}$ so $V \propto \frac{1}{r^2}$ (a)

69 (d) 0 $+8 - 10 + 2 = +10 - 10 = 0$

70 $C' = \varepsilon_r C$ $\varepsilon_r = \frac{C'}{C} = \frac{48}{4} = 12$ (c)

71. (d) infinite resistance

72. $F = BIl\sin\theta$ Conductor $\parallel$ to 'B' so $\theta = 0$ $F = 0$ (a)

73. (a) ac only

74 (c) Voltage is more but current is less

75 $V_{rms} = 200\,V$ $V_0 = V_{rms} \times \sqrt{2} = 200 \times 1.414 \Rightarrow 282.8\,V$ (d)

76. (b) $X_L = X_C$ if current is maximum & impedance is minimum

77. (c) frequency of visible range $\gamma_1 = 4 \times 10^{14}\,Hz$ to $8 \times 10^{14}\,Hz$

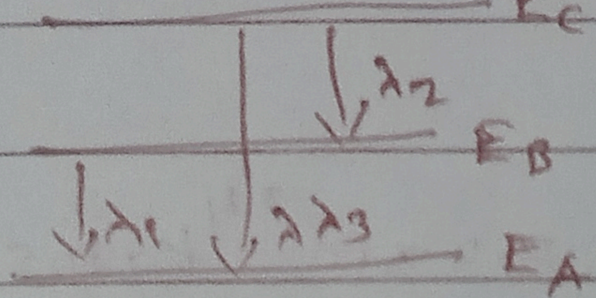
$c = \gamma\lambda$ $\lambda = \frac{c}{\gamma} \Rightarrow$ using formula $\Rightarrow 0.7 \times 10^{-6}\,m$ to $0.375 \times 10^{-6}\,m$

78. Wave front at finite distance Spherical (a)

79. $S \propto \frac{1}{\lambda^4}$ $\lambda' = \lambda/2$ (c) increased by 16 times

80. $\frac{C_a}{C_m} = \mu \Rightarrow$ (c) refractive index of medium

81. (b) $E = 3 \times 10^4\,V/m$, $B = 2 \times 10^{-3}\,wb/m$ $V = \frac{E}{B} = \frac{3 \times 10^4}{2 \times 10^{-3}} = 1.5 \times 10^7\,m/s$

82. 

$\frac{1}{\lambda_3} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$ (b)

$\lambda_3 = \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$

83. (a) X-rays

84. $hr = hr_0 + \frac{1}{2} mv^2 \Rightarrow \frac{1}{2} mv^2 = h(r - r_0)$ (a)

85. (c) quantum theory of light

86. (d) $\Delta m = 0.03$ amu $BE = \Delta mc^2 = 0.03 \times 931$ Mev
$= 27.93$ Mev

87. (a) uncontrolled nuclear fission

88. (b) which has same numbers of proton's but different no neutrons

89. (b) type of semiconductor material

90. $a_e \rightarrow$ 0.7ev (c)

91. (d) independent of the above

92. (e) antennas

93. (e) a helium atom, two positrons, two neutrinos 27 Mev
$4_1H^1 \rightarrow 2_2He^4 + 2_1e^0 + 2\gamma$ (27 MeV)

94. $\frac{\theta}{I} = I_s = \frac{NBA}{CG} \Rightarrow N \uparrow G \uparrow$ so $I_s \rightarrow$ same
(a) (a)

95. $F = BqV = 0.5 \times 1.6 \times 10^{-19} \times 3 \times 10^7 = 2.4 \times 10^{-13}$ N (a)

96. (b) Zero $\tau = nBIA \sin\theta$ ($\theta = 0$ $\tau = 0$)

97. $E_s = 11$ KV $E_p = 220$ V $\frac{N_s}{N_p} = ?$

$\frac{N_s}{N_p} = \frac{E_s}{E_p} = \frac{11 \times 10^3}{220} = \frac{110 \times 10^2}{220} = 0.5 \times 10^2 = 50 : 1$ (c)

98. $\phi = NBA\cos\theta$, $\varepsilon = \varepsilon_0 \sin\omega t$ $\theta = 0$ (c) ϕ = max, $\varepsilon = 0$

99. $E_p = 2E_n = 2(-13.6 eV) = -27.2$ eV (c)

100. $n_1 = 3$, $n_2 = \infty$ $\frac{1}{\lambda} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right) \Rightarrow \lambda = \frac{9}{R}$ (b)
(Shortest wavelength)