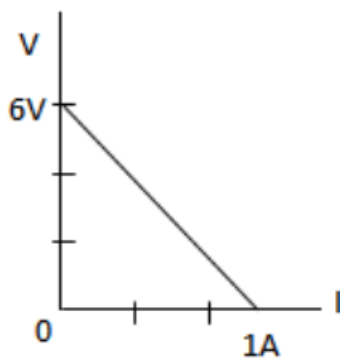


DELHI PUBLIC SCHOOL JAMMU
Session (2019-20)
Pre-Board II
Assignment for Class 12th
Subject- Physics

- Q01 A plane mirror makes an angle of 30° with horizontal. If a vertical ray strikes the mirror, find the angle between mirror and reflected ray
(a) 30° (b) 45° (c) 60° (d) 90°
- Q02 An object of length 2.5 cm is placed at a distance of $1.5f$ from a concave mirror where f is the magnitude of the focal length of the mirror. The length of the object is perpendicular to the principle axis. The length of the image is
(a) 5 cm, erect (b) 10 cm, erect (c) 15 cm, erect (d) 5 cm, inverted
- Q03 32. An object of length 6cm is placed on the principal axis of a concave mirror of focal length f at a distance of $4f$. The length of the image will be
(a) 2 cm (b) 12 cm (c) 4 cm (d) 1.2 cm
- Q04 The masses of neutron and proton are 1.0087 amu and 1.0073 amu respectively. If the neutrons and protons combine to form a helium nucleus (alpha particles) of mass 4.0015 amu. The binding energy of the helium nucleus will be [1 amu= 931 MeV]
(a) 28.4 MeV (b) 20.8 MeV (c) 27.3 MeV (d) 14.2 MeV
- Q05 The counting rate observed from a radioactive source at $t = 0$ second was 1600 counts per second and at $t = 8$ seconds it was 100 counts per second. The counting rate observed as counts per second at $t = 6$ seconds will be
(a) 400 (b) 300 (c) 200 (d) 150
- Q06 A potential difference of V is applied at the ends of a copper wire of length l and diameter d . On doubling only d , drift velocity
(a) Becomes two times (b) Becomes half (c) Does not change (d) Becomes one fourth
- Q07 An aluminium rod of length 3.14 m is of square cross-section 3.14 mm^2 . What should be the radius of 1 m long another rod of same material to have equal resistance
(a) 2 mm (b) 4 mm (c) 1 mm (d) 6 mm
- Q08 The de-Broglie wavelength of a neutron at 27°C is λ . What will be its wavelength at 927°C
(a) $\lambda/2$ (b) $\lambda/3$ (c) $\lambda/4$ (d) $\lambda/9$
- Q09 Light of frequency 8×10^{15} is incident on a substance of photoelectric work function 6.125 eV. The maximum kinetic energy of the emitted photoelectrons is
(a) 17 eV (b) 22 eV (c) 27 eV (d) 37 eV
- Q10 A wire of fixed length is turned to form a coil of one turn. It is again turned to form a coil of three turns. If in both cases same amount of current is passed, then the ratio of the intensities of magnetic field produced at the centre of a coil will be
(a) 9 times of first case (b) times of first case (c) 3 times of first case (d) times of first case
- Q11 Two solenoids having lengths L and $2L$ and the number of loops N and $4N$, both have the same current, then the ratio of the magnetic field will be
(a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1
- Q12 While a collector to emitter voltage is constant in a transistor, the collector current changes by 8.2 mA when the emitter current changes by 8.3 mA. The value of forward current ratio h_{fe} is
(a) 82 (b) 83 (c) 8.2 (d) 8.3

- Q13 Horizontal and vertical components of earth's magnetic field at a place are equal. The angle of dip at that place is _____
- Q14 A free floating magnetic needle at North pole is _____ to the surface of earth..
- Q15 An electron is accelerated through a potential difference of 100 V, then de-Broglie wavelength associated with it is approximately _____ A°
- Q16 If the angular speed of the armature of a dynamo is doubled then the amplitude of the induced e.m.f will become _____.
- Q17 An equilateral prism is made up of material of refractive index . The angle of minimum deviation of light passing through the prism is _____.
- Q18 A force F is acting between two charges placed some distance apart in vacuum. If a brass rod is placed between these two charges, how does the force change?
- Q19 The plot of the variation of potential difference across a combination of three identical cells in series, versus current is as shown below. What is the emf of each cell?



- Q20 Uniform electric and magnetic fields are produced pointing to the same direction. An electron is projected in the direction of the fields. What will be the effect on the kinetic energy of the electron due to the two fields?
- Q21 Why the oscillations of a copper disc in a magnetic field are lightly damped?
- Q22 The amplitude of oscillating electric field in an electromagnetic wave is 50 v m^{-1} . What is the amplitude of the oscillating magnetic field?
- Q23 What is the shape of the wavefront when light is diverging from a point source?
- Q24 Calculate the threshold frequency of photon for photoelectric emission from a metal of work function 0.1eV?
- Q25 What type of impurity is added to obtain n-type semiconductor?
- Q26 Define the term resistivity and write its SI unit. Derive the expression for the resistivity of a conductor in terms of number density of free electrons and relaxation time
- Q27 Define the term magnetic dipole moment of a current loop. Write the expression for the magnetic moment when an electron revolves at a speed 'v', around an orbit of radius 'r' in hydrogen atom.
- Q28 How does the self induction of a coil change when?
 (1) The number of turns in a coil is decreased
 (2) An iron rod is introduced into it. Justify.
- Q29 What are optical fibres? Give their one use?
- Q30 In young's double slit experiment how is the fringe width change when
 (a) Light of smaller frequency is used
 (b) Distance between the slits is decreased?
- Q31 How the angular separation and visibility of fringes in Young will's double slit experiment change when (i) screen is moved away from the plane of the slits, and (ii) width of the source slit is increased?

- Q32 An electron and an alpha particle have the same De Broglie wavelength associated with them? How are their kinetic energies related to each other?
- Q33 State Gauss Theorem. A thin charged wire of infinite length has line charge density ' λ '. Derive expression for electric field at a distance ' r '.
- Q34 A parallel plate capacitor is charged by a battery to a potential V . It is disconnected and a dielectric slab is inserted to completely fill the space between the plates. How will
 (a) its capacitance
 (b) electric field between the plates and
 (c) energy stored in the capacitor be affected? Justify your answer in each case
- Q35 Draw Circuit diagram for a meter bridge to determine the unknown resistance of a resistor. Obtain the balance condition for a meter bridge. Find the shift in the balance point for a meter bridge when two resistors in its two gaps, are interchanged.
- Q36 What are eddy currents? Write their important applications. Why are eddy currents produced in the cores of transformers and a.c. generators disadvantageous. How can they be minimised?
- Q37 By stating sign conventions and assumptions used derive the relation between u, v and f in case of a concave mirror?
- Q38 Define total internal reflection of light? Hence write two advantages of total reflecting prisms over a plane mirror?
- Q39 Establish Einstein's photoelectric equation. Use this equation to explain the laws of photoelectric emission.
- Q40 Draw a graph showing the variation of stopping potential with the frequency of incident radiation in relation to photoelectric effect.
 (a) What does the slope of this graph represent?
 (b) How can the value of Planck's constant be determined from this graph?
 (c) How can the value of work function of the material be determined from this graph.
- Q41 State radioactive decay law and hence derive its relation
- Q42 Draw a curve between mass number and binding energy per nucleon. Give two salient features of the curve. Hence define binding energy?
- Q43 A parallel plate capacitor with plates of area A and separation d is charged to a potential difference V and the battery used to charge is disconnected. A dielectric slab of thickness d and dielectric constant K is now placed between the plates. Explain changes, if any, in the charge, potential difference, capacitance, electric field and energy stored in the capacitor.
- Q44 Define the term resistivity and write its SI unit. Derive the expression for the resistivity of a conductor in terms of number density of free electrons and relaxation time
- Q45 How does the self induction of a coil change when?
 (1) The number of turns in a coil is decreased
 (2) An iron rod is introduced into it. Justify.
- Q46 Draw a labelled ray diagram of a reflecting telescope. Mention its two advantages over the refracting telescope.
- Q47 How the angular separation and visibility of fringes in Young's double slit experiment change when (i) screen is moved away from the plane of the slits, and (ii) width of the source slit is increased?
- Q48 Assume that the frequency of the radiation incident on a metal plate is greater than its threshold frequency. How will the following change, if the incident radiation is doubled?
 (1) Kinetic energy of electrons
 (2) Photoelectric current