

# Punjab Board Class 12 Physics Model Papers

Class- 12  
SAMPLE PAPER, MARCH 2021  
SUBJECT – PHYSICS

Time : 3 hrs.

M. M. – 70 Marks

NOTE : Q. No. 1 has 28 parts carrying 1 mark each.

Q. No. 2 to 8 carry 2 marks each.

Q. No. 9 to 14 carry 3 marks each.

Q. No. 15 to 16 carry 5 marks each.

## Q1. Multiple Choice Questions :

- (I) If both charges and distance between them is doubled, then electrostatic force will be  
(a)  $F$  (b)  $2F$  (c) Zero (d) None
- (II) Kirchhoff's second law is based on law of conservation of  
(a) sum of mass and energy (b) momentum  
(c) energy (d) charge
- (III) The resistance of ideal ammeter is  
(a) infinite (b) very high (c) small (d) zero
- (IV) The best material used for core of transformer is  
(a) stainless steel (b) mild steel  
(c) hard steel (d) soft iron
- (V) Which of the following radiations have least wavelength?  
(a) X-rays (b)  $\gamma$  rays (c) UV rays (d) IR rays
- (VI) The power of plane glass is  
(a) zero (b) 1 D (c) 2 D (d) infinite
- (VII) The minimum energy required to remove an electron from metal surface is called  
(a) work function (b) kinetic energy  
(c) stopping potential (d) potential energy
- (VIII) If two lenses of power +1.5D and +1.0D are placed in contact then effective power of the combination is  
(a) 2.5 D (b) 1.5 D (c) 0.5 D (d) 3.25 D
- (IX) The maximum kinetic energy of photoelectrons emitted from a metal surface when photons of energy 6eV fall on it is 4eV. The value of stopping potential in volt is  
(a) 2V (b) 4V (c) 6V (d) 10V
- (X) Which of these is not released during nuclear disintegration?  
(a)  $\alpha$  particles (b)  $\beta$  particles (c)  $\gamma$  rays (d) X rays

- (XI) Holes are majority carriers in
- (a) ionic solids (b) metals  
(c) intrinsic semiconductors (d) extrinsic semiconductors
- (XII) Which of these electromagnetic rays are suitable for RADAR systems?
- (a) X rays (b) U.V rays  
(c) visible rays (d) microwaves
- (XIII) How does the resistance of a conductor vary as a function of temperature.)
- (a) increases (b) decreases  
(c) remains same (d) first increases then decreases
- (XIV) A galvanometer can be converted to ammeter by placing
- (a) small resistance in parallel (b) small resistance in series  
(c) large resistance in parallel (d) large resistance in series
- (XV) The formation of mirage is explained by
- (a) total internal reflection of light  
(b) refraction of light  
(c) diffraction of light  
(d) dispersion of light
- (XVI) A semiconductor doped with donor impurity is
- (a) p type (b) n type  
(c) intrinsic semiconductor (d) none
- (XVII) When we apply reverse bias to a junction diode it
- (a) lowers the potential barrier  
(b) raises the potential barrier  
(c) increases the majority carriers of current  
(d) decreases the majority carries of current
- (XVIII) The S.I Unit of mutual inductance is
- (a) henry (b) weber (c) tesla (d) farad
- (XIX) According to Huygen's principle, light is a form of
- (a) particle (b) rays (c) wave (d) none of above
- (XX) When a ray of light enters a glass slab, then
- (a) its frequency and colour change  
(b) only frequency changes  
(c) its frequency and wavelength change

- (d) its frequency does not change
- (XXI) The de-Broglie wavelength of a tennis ball of mass 66g moving with velocity of 10 m/s is approximately
- (a)  $10^{-33}\text{m}$       (b)  $10^{-31}\text{m}$       (c)  $10^{-16}\text{m}$       (d)  $10^{-25}\text{m}$
- (XXII) Atoms having different atomic number as well as different mass number but having same number of neutrons are called
- (a) isotopes      (b) isobars      (c) isotones      (d) radioisotopes
- (XXIII) Which of the following in motion can not be deflected by magnetic field?
- (a) electron      (b) proton      (c) sodium ion      (d) neutron

**TRUE / FALSE :**

- (XXIV) Semiconductors can only be doped with pentavalent impurity.
- (XXV) The shape of equipotential surface due to point charge is always spherical.
- (XXVI) Magnetic dipole moment is a scalar quantity.
- (XXVII) The power of thick lens is smaller than that of thin lens.
- (XXVIII) In moving coil galvanometer, we use radial magnetic field so that the scale is linear.

**TWO MARKS QUESTIONS :**

- Q2.** No two electric lines of force intersect each other. Why?

**OR**

A capacitor is charged through a potential difference of 200V, when 0.1C charge is stored in it. How much energy will it release when it is discharged?

- Q3.** Write two differences between emf and terminal potential difference of a cell.

**OR**

The resistance in the left gap of a metre bridge is  $10\Omega$  and balance point is reached at 40 cm from left, then calculate the unknown resistance.

- Q4.** Which rule is used to find direction of magnetic field acting at a point near a current carrying straight conductor, also state this rule?
- Q5.** A capacitor blocks d.c but allows a.c to pass through it. Why?
- Q6.** Write two uses of I.R. rays.
- Q7.** Define (i) stopping potential  
(ii) work function, in relation to photoelectric emission

**OR**

Calculate the de-Broglie wavelength for electrons moving with speed of  $6 \times 10^5$  m/s.

- Q8.** Prove that nuclear density is independent of mass number.

**THREE MARKS QUESTIONS:**

**Q9.** With the help of circuit diagram explain how potentiometer is used to compare e.m.f of two cells.

**Q10.** Find magnetic field intensity at a point well within the solenoid carrying current.

**OR**

A solenoid is 2.0m long and 3.0m in diameter. It has 5 layers of windings of 1000 turns each and carries a current of 5.0 A, what is the magnetic field at its centre, given  $\mu_0 = 4\pi \times 10^{-10} \text{ T A}^{-1}\text{m}$ .

**Q11.** Define mean value of a.c Also derive expression for it.

**OR**

An a.c source of 200V, 50Hz connected across a  $400\Omega$  resistor and an inductor of  $3/\pi$  H in series. Calculate reactance, impedance, current in the coil.

**Q12.** Prove laws of refraction of light on the basis of Huygen's principle.

**OR**

In Young's experiment, two slits are kept 1mm apart and screen is placed 1m away. What is the fringe width when light of wavelength 500nm is used?

**Q13.** Find expression for radius of orbit of electrons in hydrogen atom by using Bohr's postulates.

**Q14.** With the help of circuit diagram explain the working of full wave rectifier.

**FIVE MARKS QUESTIONS :**

**Q15.** Define capacitance of parallel plate capacitor. Find expression for capacitance of parallel plate capacitor having dielectric slab introduced between the plates.

**OR**

State Gauss theorem. Using it find expression for electric field intensity due to an infinitely long straight uniformly charged wire.

**Q16.** Discuss Fraunhofer diffraction at a single slit. Also derive expression for linear width of central maximum.

**OR**

Draw a course of rays in case of astronomical refracting telescope when final image is formed at infinity. Obtain expression for its magnifying power.