



Dnyansagar Coaching Classes, A'nagar

Std. - XII

First Preliminary Exam

Time - 2 hrs

Sub- Physics - II

Max Marks - 40

Q.1 Select most Appropriate answer of the following**08**

- 1) A polarisation of light proves
 - a) Particle nature of light
 - b) Wave nature of light
 - c) Transverse nature of light
 - d) Longitudinal nature of light.
- 2) Interference of a light is a proof of
 - a) Wave nature of light
 - b) Particle nature of light
 - c) Transeverse nature of light
 - d) Longitudinal nature of light.
- 3) The internal resistance of an ideal cell is
 - a) Zero
 - b) Infinity
 - c) 1 ohm
 - d) 2 ohm.
- 4) Magnetic lines of force are :
 - a) Continuous
 - b) Discontinuous
 - c) Some times continuous and some times discontinuous
 - d) Linear.
- 5) Unit and dimension of magnetic moment are
 - a) A - m, $M^0T^0L^1A^1$
 - b) A - m, $M^0T^0L^1A^1$
 - c) A - m², $M^0T^0L^2A^1$
 - d) A - m², $M^0T^0L^{-2}A^1$
- 6) In an N-P-N transistor circuit, the collector current is 10 mA. If 90% of the electrons emitted reach the collector :
 - a) The emitter current will be 9 mA
 - b) The emitter current will be 11 mA.
 - c) The base current will be 11 mA
 - d) The base current will be - 10 mA.
- 7) Bandwidth in interference pattern is 1.3 The distance of 4th bright band from centre of interference is
 - a) 2.4mm
 - b) 4.8mm
 - c) 0.6mm
 - d) 3.6mm.
- 8) In the T.C. the deflection of 30° is produced by a current of 0.1A. The deflection of 60° will be produced by a current of
 - a) 0.2A
 - b) 0.3A
 - c) 2A
 - d) 3A.

Q.2 A) Attempt any one.**02**

- 1) When an electron beam is passed through electric field of 4500 V/M and magnetic field of 1.5×10^{-4} Wb/m², there is no deflection, what is the Velocity of electrons ?
- 2) A ray of light is incident on a glass sheet at an angle of 45°. Find angle of refraction.

P.T.O.

- B) Attempt any two.** 06
- 1) Explain and derive the refraction of plane wavefront at refraction surface.
 - 2) Describe Kelvin's method to determine the resistance of a galvanometer by using Wheatstone's bridge.
 - 3) State and prove Gauss's theorem in electrostatics.
- Q.3 A) Attempt any one.** 02
- 1) Define the terms and state the formulae for
 - i) inductive reactance
 - ii) capacitive reactance.
 - 2) Explain :
 - i) population inversion and
 - ii) optical pumping.
- B) Attempt any two.** 06
- 1) Draw Wheatstone's bridge network and obtain the condition for its balance using Kirchhoff's laws.
 - 2) State de-Broglie hypothesis. How is the wavelength of an accelerated electron determined ?
 - 3) What is (a) work function (b) stopping potential and (c) threshold wavelength of a photosensitive surface ?
- Q.4 A) Attempt any two.** 04
- 1) State four uses of Vande Graff generator.
 - 2) Draw a neat labelled diagram for diode as a full wave rectifier.
 - 3) Define.
 - i) Eddy currents
 - ii) diamagnetic substances.
- B) Attempt any two.** 04
- 1) Obtain an expression for the mechanical force per unit area of a charged conductors.
 - 2) State the principle of moving coil galvanometre. Show that the deflection produced in it is directly proportional to the current passing through it.
- Q.5 Attempt any two.** 08
- 1) A 50 ohm resistor is connected in series with an inductance of 450 Mh and a capacitor 9μ F. Determine (a) resonant Frequency (b) Current in the circuit when an A.C. voltage of 120V., operating at resonant frequency is applied to the series combination. (c) Impedance at resonance. (d) Voltages across resistor, inductor and capacitor at resonance.
 - 2) Compare the longest wavelength of Balmer series with Paschen series.
 - 3) The threshold wavelength for a certain metal is 3800 A.u. Calculate the maximum K.E. and velocity of the photoelectrons emitted when an ultraviolet light of wavelength 2500 A.u. Falls on the metal surface.
[$c = 3 \times 10^8$ m/s $h = 6.63 \times 10^{-34}$ J.S. $m = 9.1 \times 10^{-31}$ kg]