

Ts12P

Tenkasi District



Common Second Mid Term Test - 2024

26-11-2024

Standard 12

PHYSICS

PART - I

Time: 1.30 Hours

Marks: 35

I. Choose the correct answer.

10×1=10

- 1) In a Young's double slit experiment the slit separation is doubled. To maintain the same fringe spacing on the screen the screen -to - slit distance 'D' must be changed to
 - a) $\sqrt{2} D$
 - b) $2D$
 - c) $\frac{D}{\sqrt{2}}$
 - d) $\frac{D}{2}$
- 2) First Diffraction minimum due to a single slit of width $2 \times 10^{-5} \text{cm}$ is at 30° . Then wavelength of light used is
 - a) 2000 \AA
 - b) 500 \AA
 - c) 1000 \AA
 - d) 1500 \AA
- 3) In the propagation of electromagnetic waves, the angle between the direction of propagation and plane of polarisation is
 - a) 0°
 - b) 45°
 - c) 90°
 - d) 180°
- 4) The threshold wavelength for a metal surface whose photoelectric workfunction is 3.313eV is
 - a) 4125 \AA
 - b) 3750 \AA
 - c) 6000 \AA
 - d) 2062.5 \AA
- 5) In an electron microscope, the electrons are accelerated by a voltage of 14KV . If the voltage is changed to 224KV , then the de Broglie wavelength associated with the electrons would
 - a) increase by 2 times
 - b) increase by 4 times
 - c) decrease by 2 times
 - d) decrease by 4 times
- 6) If the mean wavelength of light from sun is taken as 550nm and its mean power as $3.8 \times 10^{26} \text{ watt}$ then the number of photons emitted per second from the sun is of the order of
 - a) 10^{45}
 - b) 10^{42}
 - c) 10^{54}
 - d) 10^{51}
- 7) In a Hydrogen atom, the electron revolving in the second orbit, has angular momentum equal to
 - a) h
 - b) $\frac{h}{\pi}$
 - c) $\frac{4h}{\pi}$
 - d) $\frac{2h}{\pi}$
- 8) Atomic number of H-like atom with ionization potential 122.4V for $n = 1$
 - a) 1
 - b) 2
 - c) 3
 - d) 4
- 9) If the nuclear radius of ^{27}Al is 3.6 Fermi , the approximate nuclear radius of ^{64}Cu in fermi is
 - a) 2.4
 - b) 1.2
 - c) 4.8
 - d) 3.6
- 10) The cut-off wavelength of X-rays from an X ray tube of accelerating potential $24,800 \text{V}$ is
 - a) 1 \AA
 - b) 0.5 \AA
 - c) 2 \AA
 - d) 1.5 \AA

Ts12P

2

PART - II**II. Answer any 3 questions. (Q.No. 14 is compulsory)****3×2=6**

- 11) Differentiate between Fresnel and Fraunhofer diffraction.
- 12) What is Fresnel's distance?
- 13) Define stopping potential?
- 14) How many photons per second emanate from a 50 mW laser of 640 nm?
- 15) What is distance of closest approach?

PART - III**III. Answer any 3 questions. (Q.No. 18 is compulsory)****3×3=9**

- 16) State and obtain Malus' Law
- 17) Enumerate the photo electric effect Laws
- 18) A microscope has an objective and eyepiece of focal length 5cm and 50 cm respectively with the tube length 30cm. Calculate the magnification at near point.
- 19) Derive an expression for de Broglie wavelength of electrons
- 20) Discuss the alpha decay process with example.

PART - IV**IV. Answer all the questions.****2×5=10**

- 21) Obtain the equation for bandwidth in Youngs double slit experiment.

(OR)

Briefly explain the principle and working of electron microscope

- 22) Obtain the expression for the radius of the n^{th} orbit of an electron based on Bohr's theory.

(OR)

Describe briefly Davisson - Germer experiment which demonstrated the wave nature of electrons.

SIVAKUMAR. M, Sri-Ram-malaric HSS,
Vallam-627809, Tenkasi Dist.