SECOND MID TERM TEST - 2023

Standard - XII

PHYSICS

Reg.No. | | | | | | |

Time: 1.30 hrs. *Marks: 50*

PART - I

Choose the correct answer: **10×1=10**

1. First diffraction minimum due to a single slit of width 1.0×10^{-5}cm is at 30°. Then wavelength of light used is
   a) 400Å b) 500Å c) 600Å d) 700Å
2. Two Coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are
   a) 5I and I b) 5I and 3I c) 9I and I d) 9I and 3I
3. The transverse nature of light is shown in
   a) interference b) diffraction c) scattering d) polarisation
4. Two radiations with photon energies 0.9ev and 3.3 ev respectively are falling on a metallic surface successively. If the work function of the metal is 0.6ev, then the ratio of maximum speeds of emitted electrons in the two cases will be
   a) 1:4 b) 1:3 c) 1:1 d) 1:9
5. Emission of electrons by the absorption of heat energy is called _____ emission.
   a) Photoelectric b) field c) thermionic d) secondary
6. The workfunction for metals A, B and C are 1.92 ev, 2.0 ev and 5.0 ev respectively. The metal / metals which will emit photoelectrons for a radiation of wavelength 4100Å is /are
   a) A only b) both A and B c) all the metals d) none
7. The cut-off wavelength of X-rays from an X-ray tube of accelerating potential 20,000V is
   a) 12400Å b) 2.28Å c) 1.24Å d) 0.62Å
8. 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
9. The charge of cathode rays particle is
   a) negative b) positive c) neutral d) not defined
10. In hydrogen atom, the ground state ionization energy is
    a) 13.6 ev b) -13.6 ev c) 10.2 ev d) 12.1 ev

PART - II

Answer any 5 questions. Question No.14 is compulsory. **5×2=10**

11. Mention the differences between interference and diffraction.
12. What is angle of Polarisation?
13. Define Stopping potential.

14. Calculate the power of the lens of the spectacles needed to rectify the defect of near sightedness for a person who could see clearly upto a distance of 1.8m.
15. What is Bremsstralung?
16. Give any two applications of Photocell.
17. What is meant by excitation energy.
18. Define - Curie.

PART - III

Answer any five questions. Question No.20 is compulsory. 5×3=15

19. Discuss about Nicol prism.
20. What should be the velocity of electrons so that its momentum equals that of 4000Å wavelength photon.
21. List of uses of Polaroids.
22. Differentiate between Fresnel and Fraunhofer diffraction.
23. Derive an expression for de Broglie wavelength of electrons.
24. How do we obtain characteristic X - ray spectra?
25. Discuss the properties of neutrino.
26. Discuss the alpha decay process with an example.

PART - IV

Answer all the questions: 3×5=15

27. a) Discuss the spectral series of hydrogen atom.

(OR)

b) Discuss the diffraction at a grating and obtain the condition for the m^{th} maximum.

28. a) Briefly explain the principle and working of electron microscope.

(OR)

b) Obtain the equation for bandwidth in Young's double slit experiment.

29. a) Obtain the law of radioactivity.

(OR)

b) Obtain Einstien's photoelectric equation with necessary explanation.