Class : 12

SECOND MID TERM TEST - 2024

Time Allowed : 1.30 Hours|

PHYSICS

YouTube/ Akwa Academy

[Max. Marks : 50

PART – I

Choose the correct Answer.   10x1=10

1. The transverse nature of light is shown in,

   (a) Interference   (b) diffraction   (c) scattering   (d) polarisation

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 3 I

3. The ratio between the radius of first three orbits of hydrogen atom is

   (a) 1 : 2 : 3   (b) 2 : 4 : 6   (c) 1 : 4 : 9   (d) 1 : 3 : 5

4. A ray of light strikes a glass plate at an angle 60°. If the reflected and refracted rays are perpendicular to each other, the refractive index of the glass is,

   (a) $\sqrt{3}$ (b) $\frac{3}{2}$ (c) $\sqrt{\frac{3}{2}}$ (d) 2

5. Atomic number of H-like atom with ionisation potential 122.4V for n=1 is

   (a) 1   (b) 2   (c) 3   (d) 4

6. Emission of electrons by the absorption of heat energy is called ------------ emission.

   (a) Photoelectric   (b) Field   (c) Thermionic   (d) Secondary

7. The ratio of the wavelengths radiation emitted for the transition from n =2 to n = 1 in Li^{++}, He^+ and H is

   (a) 1 : 2 : 3   (b) 1 : 4 : 9   (c) 3 : 2 : 1   (d) 4 : 9 : 36

8. If the nuclear radius of 27Al is 3.6 fermi, the approximate nuclear radius of 64Cu in fermi is

   (a) 2.4   (b) 1.2   (c) 4.8   (d) 3.6

9. A plane glass is placed over a various coloured letters (violet, green, yellow, red) The letter which appears to be raised more is,

   (a) red   (b) yellow   (c) green   (d) violet

10. The charge of cathode rays particle is

    (a) Positive   (b) negative   (c) neutral   (d) not defined

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PART – II

II. **Answer any five questions (Q.No: 16 compulsory)**   5x2=10

11. What is surface barrier?

12. Give the applications photocell

13. Write the properties of cathode rays.

14. Differentiate between Fresnel and Fraunhofer diffraction

15. State Huygens' principle

16. Calculate the cut-off wavelength and cutoff frequency of x-rays from an x –ray tube of accelerating potential 20,000 V.

17. Define curie.

PART – III

III. **Answer any five questions (Q.No: 24 compulsory)**   5x3=15

18. List out the laws of photoelectric effect

19. Derive an expression for de Broglie wavelength of electrons

20. Give the symbolic representation of alpha decay, beta decay and gamma emission

21. Write down the postulates of Bohr atom model.

22. List the uses of polaroids

23. State and derive the Brewster's law.

24. Calculate the number of nuclei of carbon-14 undecayed after 22,920 years if the initial number of carbon-14 atoms is 10,000. The half-life of carbon-14 is 5730 years

PART – IV

IV. **Answer all the question**   3x5=15

25. a) Describe briefly Davisson – Germer experiment which demonstrated the wave nature of electrons

(OR)

b) Give the construction and working of photo emissive cell.

26. a) Explain about compound microscope and obtain the equation for the magnification.

(OR)

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

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

(OR)

b) Explain the J.J. Thomson experiment to determine the specific charge of electron.

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