திருவள்ளூர் மாவட்டம்

13.11.2024

SECOND MID TERM TEST - 2024

Standard XII

Reg.No. | | | | | | |

PHYSICS

Part - I

Time : 1.30 hrs *Marks : 50*

I. Choose the correct answer: 10 x 1 = 10

1. The transverse nature of light is shown in
   a) interference b) diffraction c) scattering d) polarisation
2. Light transmitted by Nicol prism is
   a) partially polarised b) unpolarised
   c) plane polarised d) elliptically polarised
3. Type of material which emits white light in LED:
   a) GaInN b) Sic c) AlGap d) GaASP
4. 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) 400 Å b) 500 Å c) 600 Å d) 700 Å
5. In Bohr atom model when the principal quantum number (n) increases the velocity of electron
   a) increases and then decreases b) increases
   c) decreases d) remains constant
6. The wavelength λ_e of an electron and λ_p of a photon of same energy E are related by
   a) $\lambda_p \alpha \lambda_e$ b) $\lambda_p \alpha \sqrt{\lambda_e}$ c) $\lambda_p \alpha \frac{1}{\sqrt{\lambda_e}}$ d) $\lambda_p \alpha \lambda_e^2$
7. The threshold wavelength for a metal surface whose photoelectric work function is 3.313 eV is
   a) 4125 Å b) 3750 Å c) 6000 Å d) 2062 Å
8. Emission of electrons by the absorption of heat energy is called _____ emission.
   a) photoelectric b) field c) thermionic d) secondary
9. The charge of cathode rays particle is
   a) positive b) negative c) neutral d) not defined
10. A light of wavelength 500 nm is incident on a sensitive metal plate of photo electric work function 1.235 eV. The kinetic energy of the photo electrons emitted is ($h = 6.6 \times 10^{-34}$ JS)
    a) 0.58 eV b) 2.48 eV c) 1.24 eV d) 1.16 eV

Part - II

II. Answer any 5 questions. (Q.No.14 is compulsory) 5 x 2 = 10

11. State Brewster's law.
12. Mention the difference between interference and diffraction.

13. Define : Work function of a metal. Give its unit.
14. Calculate the momentum of an electron with kinetic energy 2 eV.
15. State Malus law.
16. Define : Stoping potential
17. What is meant by excitation energy?
18. Calculate the radius of $_{79}Au^{197}$

Part - III

III. Answer any 5 questions. (Q.No.20 is compulsory) **5 x 3 = 15**

19. Differentiate between Fresnel and Fraunhofer diffraction.
20. The ratio of maximum and minimum intensities in an interference pattern is 36:1. What is the ratio of the amplitude of the two interfering waves?
21. List of uses of polaroids.
22. Derive an expression for de-Broglie wavelength of electrons.
23. List out the characteristics of photons.
24. Write a note in applications of X-ray in
    i) Industries ii) Scientific research
25. Discuss the alpha decay process with an example.
26. Write the properties of cathode rays.

Part - IV

IV. Answer all the questions. **3 x 5 = 15**

27. a) Obtain the law of radioactivity.

    (OR)

    b) Obtain Einstein's photo electric equation with the necessary explanation.
28. a) Discuss the spectral series of hydrogen atom.

    (OR)

    b) Obtain the equation for bandwidth in Young's double slit experiment.
29. a) Describe briefly Davisson-Germer experiment which demonstrated the wave nature of electrons.

    (OR)

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

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