

Chapter :- **Dual nature of radiation and matter**

Assignment 1

Class 12

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| **Class : XIIth Subject : PHYSICS**  **Date : DPP No. : 1** |

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| **Topic :- Dual nature of radiation and matter** |

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| **1.** | **The ratio of the energy of an -ray photon of wavelength to that of visible light of wavelength is** | | | | | | | |
|  | **a)** | **1 :5000** | **b)** | **5000 :1** | **c)** |  | **d)** |  |
| 2. | If light of wavelength is allowed to fall on a metal, then kinetic energy of photoelectrons emitted is If wavelength of light changes to then kinetic energy of electrons changes to Then work function of the metal is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 3. | When two different materials *A* and *B* having atomic number and are used as the target in Coolidge -ray tube at different operating voltage and respectively their spectrums are found as below.    The correct relation is | | | | | | | |
|  | a) | and | b) | and | c) | and | d) | and |
| **4.** | **If the linear momentum of a particle is -, then what will be its de-Broglie wavelength?**  **(Take** | | | | | | | |
|  | **a)** | **m** | **b)** | **nm** | **c)** | **m** | **d)** | **nm** |
| **5.** | **The rest mass of the photon is** | | | | | | | |
|  | **a)** | **0** | | | **b)** |  | | |
|  | **c)** | **Between 0 and** | | | **d)** | **Equal to that of an electron** | | |
| **6.** | **The value of Plank energy is** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| **7.** | **The ratio of specific charge of an -particle to that of a proton is** | | | | | | | |
|  | **a)** | **2 :1** | **b)** | **1 :1** | **c)** | **1 :2** | **d)** | **1 :3** |
| 8. | The correct graph between the maximum energy of a photoelectron and the inverse of wavelength of the incident radiation is given by the curve  *A*  *C*  1*/λ*  1*/λ*0  *K*max  0  *B* | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| **9.** | **Two identical metal plates shown photoelectric effect by a light of wavelength falls on plate A and on plate The maximum kinetic energy is** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| **10.** | **Quantum nature of light is explained by which of the following phenomenon** | | | | | | | |
|  | **a)** | **Huygen wave theory** | | | **b)** | **Photoelectric effect** | | |
|  | **c)** | **Maxwell electromagnetic theory** | | | **d)** | **De-Broglie theory** | | |
| **11.** | **Energy from the sun is received on earth at the rate of 2 cal per per min. if average wavelength of solar light be taken at 5500 A then how many photons are received on the earth per per min?**  **(Take Js, 1cal=4.2 J).** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| **12.** | **Which phenomenon best supports the theory that matter has a wave nature** | | | | | | | |
|  | **a)** | **Electron momentum** | **b)** | **Electron diffraction** | **c)** | **Photon momentum** | **d)** | **Photon diffraction** |
| 13. | The figure represents the observed intensity of -rays emitted by an -ray tube as a function of wavelength. The sharp peaks and denote  *A*  *O*  Wave length  *B*  Intensity | | | | | | | |
|  | a) | Band spectrum | | | b) | Continuous spectrum | | |
|  | c) | Characteristic radiations | | | d) | White radiations | | |
| **14.** | **The frequency of a photon, having energy is (-)** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| **15.** | **Which of the following have highest specific charge** | | | | | | | |
|  | **a)** | **Positron** | **b)** | **Proton** | **c)** |  | **d)** | **None of these** |
| **16.** | **Planck’s constant has the dimensions of** | | | | | | | |
|  | **a)** | **Energy** | **b)** | **Mass** | **c)** | **Frequency** | **d)** | **Angular momentum** |
| **17.** | **The de-Broglie wavelength is proportional to** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| **18.** | **A parallel beam of light is incident normally on a plane surface absorbing 40% of the light and reflecting the rest. If the incident beam carries 60 W of power, the force exerted by it on the surface is** | | | | | | | |
|  | **a)** |  | **b)** |  | **c)** |  | **d)** |  |
| 19. | Given below is a list of electromagnetic spectrum and its mode of production. Which one does not match | | | | | | | |
|  | a) | Gamma rays – Radioactive of the nucleus | | | | | | |
|  | b) | Ultraviolet – Magnetron valve | | | | | | |
|  | c) | Infrared – Vibration of atoms and molecules | | | | | | |
|  | d) | Radiowave – Rapid acceleration and decelaration of electrons in conducting wires | | | | | | |
| 20. | A proton of mass kg enters a uniform magnetic field of 1 T at point as shown in figure, with a speed of . The magnetic field is directed normal to the plane of paper downwards. The proton emerges out of the magnetic field at point , then the distance and the value of angle will respectively be | | | | | | | |
|  | a) | 0.7 m, | b) | 0.7 m, 90 | c) | 0.14 m, 90 | d) | 0.14 m, 45 |