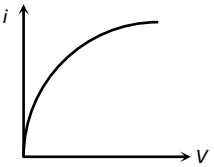
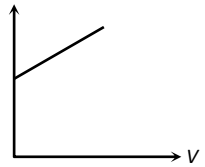
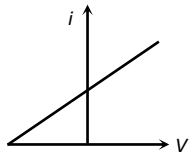
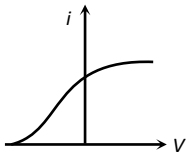
**DPP**
DAILY PRACTICE PROBLEMS

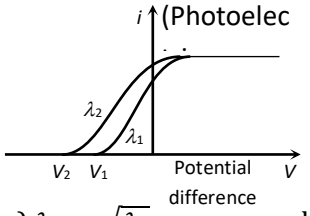
**Class : XIIth** **Subject : PHYSICS**
**Date :** **DPP No. : 2**

# Topic :- Dual nature of radiation and matter

1. The uncertainty in the position of a particle is equal to the de-Broglie wavelength. The uncertainty in its momentum will be
   a) $h/\lambda$ b) $2h/3\lambda$ c) $\lambda/h$ d) $3\lambda/2h$
2. The work functions for sodium and copper are $2eV$ and $4eV$. Which of them is suitable for a photocell with 4000 Å light
   a) Copper b) Sodium c) Both d) Neither of them
3. The curve between current $(i)$ and potential difference $(V)$ for a photo cell will be
   a) 
   
   b) 
   
   c) 
   
   d) 
   
4. What will be the number of photons emitted per second by a 10 W sodium vapour lamp assuming that 90% of the consumed energy is converted into light? Wavelength of sodium light is 590 nm, $h = 6.63 \times 10^{-34}$J-s.
   a) $0.267 \times 10^{18}$ b) $0.267 \times 10^{19}$ c) $0.267 \times 10^{20}$ d) $0.267 \times 10^{17}$
5. For the Bohr's second orbit of circumference $2\pi r$, the de-Broglie wavelength of revolving electron will be
   a) $2\pi r$ b) $\pi r$ c) $\frac{1}{2\pi r}$ d) $\frac{1}{4\pi r}$
6. The work function of a metal is
   a) The energy for the electron to enter into the metal
   b) The energy for producing X-ray
   c) The energy is required for an electron to come out from metal surface
   d) None of these
7. If the uncertainty in the position of proton is $6 \times 10^{8}$m, then the minimum uncertainty in its speed will be
   a) 1 $\text{cms}^{-1}$ b) 1 $\text{ms}^{-1}$ c) 1 $\text{mms}^{-1}$ d) 100 $\text{ms}^{-1}$
8. The work function for metals $A, B$ and $C$ are respectively 1.92 $eV$, 2.0 $eV$ and 5 $eV$. According to Einstein's equation, the metals which will emit photo electrons for a radiation of wavelength 4100 Å is/are
   a) None of these b) $A$ only c) $A$ and $B$ only d) All the three metals
9. Among the following four spectral regions, the photons has the highest energy in

a) Infrared b) Violet c) Red d) Blue

10. Kinetic energy of emitted cathode rays is dependent on
    a) Only voltage b) Only work function
    c) Both (a) and (b) d) It does not depend upon any physical quantity
11. An electron is accelerated under a potential difference of 182 V. The maximum velocity of electron will be
    (Charge of an electron is $1.6 \times 10^{-19}$ C and its mass is $9.1 \times 10^{-31}$ kg)
    a) $5.65 \times 10^{6}$ m/s b) $4 \times 10^{6}$ m/s c) $8 \times 10^{6}$ m/s d) $16 \times 10^{6}$ m/s
12. If the voltage of $X$-rays tube is doubled, the intensity of $X$-rays will become
    a) Half b) Unchanged c) Double d) Four times
13. Bragg's law for $X$-rays is
    a) $d \sin\theta = 2n\lambda$ b) $2d \sin\theta = n\lambda$ c) $n \sin\theta = 2\lambda d$ d) None of these
14. An electron of charge $'e'$ coulomb passes through a potential difference of $V\ volts$. Its energy in $'joules'$ will be
    a) $V/e$ b) $eV$ c) $e/V$ d) $V$
15. When cathode-rays strike a metal target of high melting point with a very high velocity, then which of the following are produced
    a) $\alpha$-rays b) $X$-rays c) Ultraviolet rays d) $\gamma$-waves
16. A photon of energy 8 $eV$ is incident on a metal surface of threshold frequency $1.6 \times 10^{15} Hz$, then the maximum kinetic energy of photoelectrons emitted is $(h = 6.6 \times 10^{-34} Js)$
    a) 4.8 $eV$ b) 2.4 $eV$ c) 1.4 $eV$ d) 0.8 $eV$
17. The kinetic energy of an electron is 5 $eV$. Calculate the de-Broglie wavelength associated with it $(h = 6.6 \times 10^{-34} Js, m_e = 9.1 \times 10^{-31} kg)$
    a) 5.47 Å b) 10.9 Å c) 2.7 Å d) None of these
18. Order of $q/m$ ratio of proton, $\alpha$-particle and electron is
    a) $e > p > \alpha$ b) $p > \alpha > e$ c) $e > \alpha > p$ d) None of these
19. In the following diagrams if $V_2 > V_1$ then




    a) $\lambda_1 = \sqrt{\lambda_2}$ b) $\lambda_1 < \lambda_2$ c) $\lambda_1 = \lambda_2$ d) $\lambda_1 > \lambda_2$
20. Ultraviolet radiations of 6.2 eV falls on an aluminium surface. KE of fastest electron emitted is (work function = 4.2 eV)
    a) $3.2 \times 10^{-21}$J b) $3.2 \times 10^{-19}$J c) $7 \times 10^{-25}$ J d) $9 \times 10^{-32}$ J