DPP
DAILY PRACTICE PROBLEMS

CLASS : XIITH **SUBJECT : PHYSICS**
DATE : **DPP NO. : 5**

Topic :-Atoms

1. The energy of an electron in an excited hydrogen atom is - 3.4 eV. Its angular momentum is
   a) 3.72×10^{-34} Js b) 2.11×10^{-34} Js c) 1.57×10^{-34} Js d) 1.11×10^{-34} Js

2. The largest wavelength in the ultraviolet region of the hydrogen spectrum is 122 nm. The smallest wavelength in the infrared region of the hydrogen spectrum (to the nearest integer) is
   a) 802 nm b) 823 nm c) 1882 nm d) 1648 nm

3. If λ_1 and λ_2 are the wavelengths of the first members of the Lyman and Paschen series respectively, then $\lambda_1 : \lambda_2$ i
   a) 1:3 b) 1:30 c) 7:50 d) 7:108

4. Which of the following lines of the H-atom spectrum belongs to the Balmer series?
   a) 1025 Å b) 1218 Å c) 4861 Å d) 18751 Å

5. Continuous emission spectrum is produced by
   a) Incandescent electric lamp b) Mercury vapour lamp
   c) Sodium vapour lamp d) Polyatomic substances

6. The ionisation potential of hydrogen atom is 13.6 eV. The energy required to remove an electron from the second orbit of hydrogen will be
   a) 27.4 eV b) 13.6 eV c) 3.4 eV d)None of these

7. In a hydrogen atom, the electron is making 6.6×10^{15} revs^{-1} around the nucleus in an orbit of radius 0.528 Å.The magnetic moment (Am^2) will be
   a) 1×10^{-15} b) 1×10^{-10} c) 1×10^{-23} d) 1×10^{-27}

8. The ratio of longest wavelength and the shortest wavelength observed in the fifth spectral series of emission spectrum of hydrogen is
   a) 4/3 b)525/376 c) 36/11 d) 960/11

9. In an atom, the two electrons move round the nucleus in circular orbits of radii R and $4R$. The ratio of the times taken by them to complete one revolution is

a) 1/4 b) 4/1 c) 8/1 d) 1/8

10. Which of the following transition gives the photon of minimum frequency?

a) n=2 to n=1 b) n =3 to n=1 c) n =3 to n=2 d) n =4 to n=3

11. Let the potential energy of hydrogen atom in the ground state be regarded as zero. Then its potential energy in the first excited state will be

a) 20.4 eV b) 13.6 eV c) 3.4 eV d)10.2eV

12. Of the following transition in the hydrogen atom, the one which gives an emission line of the highest frequency is

a) n =1 to n=2 b) n =2 to n=1 c) n =3 to n=10 d) n =10 to n=3

13. The acceleration of electron in the first orbit of hydrogen atom is

a) $\frac{4\pi^2 m}{h^3}$ b) $\frac{h^2}{4\pi^2 mr}$ c) $\frac{h^2}{2\pi^2 m^2 r^3}$ d) $\frac{m^2 h^2}{4\pi^2 r^3}$

14. The ratio of minimum wavelength of Lyman and Balmer series will be

a) 10 b)5 c) 0.25 d) 1.25

15. The first excitation potential of a given atom is 10.2 V. Then ionisation potential must be

a) 20.4 V b) 13.6 V c) 30.6 V d) 40.8 V

16. As the electron in Bohr orbit of hydrogen atom passes from state n=2 to n=1 , the kinetic energy K and potential energy U change as

a) K two-fold, U four-fold b) K four-fold, U two-fold

c) K four-fold, U also four-fold d) K two-fold, U also two-fold

17. The wavelength of the first spectral line of sodium is 5896 Å. The first excitation potential of sodium atom will be ($h = 6.63 \times 10^{-34}$Js)

a) 4.2 V b) 3.5 V c) 2.1 V d) None of these

18. The ratio of areas of the electron orbits for the first excited state and the ground state for the hydrogen atom i

a) 4:1 b) 16:1 c)8:1 d) 2:1

19. The total energy of an electron in the first excited state of hydrogen is about - 3.4eV. Its kinetic energy in this state is

a) - 3.4 eV b) - 6.8 eV c) 6.8 eV d) 3.4 eV

20. If $E_P$and E_K are the potential energy and kinetic energy of the electron in stationary orbit in the hydrogen atom, the value of $\frac{E_P}{E_K}$ is

a) 2 b) - 1 c) 1 d) - 2