DPP
DAILY PRACTICE PROBLEMS

CLASS : XIITH **SUBJECT : PHYSICS**
DATE : **DPP NO. : 3**

Topic :-Atoms

1. The angular momentum of electron in hydrogen atom is proportional to
   a) $\sqrt{r}$ b) $1/r$ c) r^2 d) $1/\sqrt{r}$

2. Hydrogen atoms are excited from ground state of the principal quantum number 4. Then the number of spectral lines observed will be
   a) 3 b) 6 c) 5 d) 2

3. Wavelength of first line in Lyman series is λ. The wavelength of first line in Balmer series is
   a) $\frac{5}{27}\lambda$ b) $\frac{36}{5}\lambda$ c) $\frac{27}{5}\lambda$ d) $\frac{5}{36}\lambda$

4. Mercury vapour lamp gives
   a) Continuous spectrum b) Line spectrum
   c) Band spectrum d) Absorption spectrum

5. For an electron in the second orbit of Bohr's hydrogen atom, the moment of linear momentum is
   a $n\pi$ b) $2\pi h$ c) $\frac{2h}{\pi}$ d) $\frac{h}{\pi}$

6. The angular momentum (L) of an electron moving in a stable orbit around nucleus is
   a) Half integral multiple of $\frac{h}{2\pi}$ b) integral multiple of h
   c) integral multiple of $\frac{h}{2\pi}$ d) Half integral multiple of h

7. The shortest wavelength in Lyman series is 91.2 nm. The longest wavelength of the series is
   a) 121.6 nm b) 182.4 nm c) 234.4 nm d) 364.8 nm

8. The first excited state of hydrogen atoms is 10.2 eV above its ground state. The temperature needed to excite hydrogen atoms to first excited level, is
   a) 7.9×10^4 K b) 3.5×10^4 K c) $5.8 \times 10^4 K$ d) 14×10^4 K

9. The ratio of the energies of the hydrogen atom in its first to second excited states is
   a) 9/4 b) 4/1 c) 8/1 d) 1/8

10. If λ is the wavelength of hydrogen atom from the transition n =3 to n=1, then what is the wavelength for

doubly ionised lithium ion for same transition?

a) $\frac{\lambda}{3}$ b) 3λ c) $\frac{\lambda}{9}$ d) $9\,\lambda$

11. In H spectrum, the wavelength of H_α line is 656 nm whereas in a distance galaxy, the wavelength of H_α line is 706 nm. Estimate the speed of galaxy with respect to earth

a) $2 \times 10^8 ms^{-1}$ b) $2 \times 10^7 ms^{-1}$ c) $2 \times 10^6 ms^{-1}$ d) $2 \times 10^5 ms^{-1}$

12. In a hydrogen atom, the electron in a given orbit has total energy -1.5 eV. The potential energy is

a) 1.5 eV b) -1.5 eV c) 3.0 eV d) -3.0 eV

13. The first member of the Balmer's series of the hydrogen has a wavelength λ, the wavelength of the second member of its series is

a) $\frac{27}{20}\lambda$ b) $\frac{20}{27}\lambda$ c) $\frac{27}{20}\lambda$ d) None of these

14. Energy required for the electron excitation in Li^{2+} from the first to the third Bohr orbit is

a) 36.3 eV b) 108.8 eV c) 122.4 eV d) 12.1eV

15. The ionisation potential of mercury is 10.39 V. How far an electron must travel in an electric field of 1.5×10^6 Vm^{-1} to gain sufficient energy to ionize mercury?

a) $\frac{10.39}{1.5 \times 10^6} \times 1.0 \times 10^{-19}$ m b) $\frac{10.39}{1.5 \times 10^6}$m

c) $1.39 \times 1.6 \times 10^{-19}$ m d) $\frac{10.39}{1.6 \times 10^{-19}}$m

16. Wavelength of light emitted from second orbit to first orbit in a hydrogen atom is

a) 6563 Å b) 4102 Å c) 4861 Å d) 1215 Å

17. White light is passed through a dilutee solution of potassium permanganate. The spectrum produced by the emergent light is

a) Band emission spectrum b) Line emission spectrum

c) Band absorption spectrum d) Line absorption spectrum

18. The magnetic moment of the ground state of an atom whose open sub-shell is half-filled with five electrons is

a) $\sqrt{35}\sqrt{\mu_B}$ b) $35\,\mu_B$ c) $35\sqrt{\mu_B}$ d) $\mu_B\sqrt{35}$

19. The wavelengths involved in the Spectrum of deuterium (^2_1D) are slightly different from that of hydrogen Spectrum, because

a) Sizes of the two nuclei are different

b) Nuclear forces are different in the two cases

c) Masses of the two nuclei are different

d) Attraction between the electron and the nucleus is different in the two cases.

20. Consider an electron in the nth orbit of a hydrogen atom in the Bohr model. The circumference of the orbit

can be expressed in terms of the de-Broglie wavelength λ of that electron as

a) $(0.529)\, n\lambda$ b) $\sqrt{n}\,\lambda$ c) $(13.6)\lambda$ d) $n\lambda$