DPP
DAILY PRACTICE PROBLEMS

CLASS : XIITH **SUBJECT : PHYSICS**
DATE : **DPP NO. : 1**

Topic :-Atoms

1. An electron of an atom transits from n_1 to n_2. In which of the following maximum frequency of photon will be emitted?
   a) n_1=1 to n_2=2 b) n_1=2 to n_2=1 c) n_1=2 to n_2=6 d) n_1=6 to n_2=2

2. If a is radius of first Bohr orbit in hydrogen atom, the radius of the third orbit is
   a) 3 a b) 9 a c) 27 a d) 81 a

3. An electron collides with a hydrogen atom in its ground state and excites it to n=3. The energy given to hydrogen atom in this inelastic collision is(neglect the recoiling of hydrogen atom)
   a) 10.2 eV b) 12.1 eV c) 12.5 eV d) None of these

4. When a hydrogen atom is bombared, the atom is excited to then $n = 4$ state. The energy released, when the atom goes from $n = 4$ state to the ground state is
   a) 1.275 eV b) 12.75 eV c) 5 eV d) 8 eV

5. Excitation energy of a hydrogen like atom in its first excitation state is 40.8 eV. Energy needed to remove the electron from the ion in ground state is
   a) 40.8 eV b) 27.2 eV c) 54.4 eV d) 13.6 eV

6. The spectral series of the hydrogen atom that lies in the visible ragion of the electromagnetic spectrum
   a) Paschen b) Balmer c) Lyman d) Brackett

7. An alpha nucleus of energy $\frac{1}{2}mv^2$ bombards a heavy nuclear target of charge Ze. Then the distance of closest approach for the alpha nucleus will be proportional to
   a) v^2 b) 1/m c) $1/v^4$ d) $1/Ze$

8. In terms of Bohr radius a_o, the radius of the second Bohr orbit of a hydrogen atoms is given by
   a) 4 a_o b) 8 a_o c) $\sqrt{2}\ a_o$ d) 2 a_o

9. The Kinetic energy of the electron in an orbit of radius r in hydrogen atom is (e =electronic charge)
   a) $\frac{e^2}{r^2}$ b) $\frac{e^2}{2r}$ c) $\frac{e^2}{r}$ d) $\frac{e^2}{2r^2}$

10. If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li^{2+} is
    a) 30.6 eV b) 13.6 eV c) 3.4 eV d) 122.4 eV

11. The ratio of minimum to maximum wavelength in Balmer series is
    a) 5:9 b) 5:36 c) 1:4 d) 3:4

12. V_1 is the frequency of the series limit of Lyman series, V_2 is the frequency of the first line of Lyman series and V_3 is the frequency of the series limit of the Balmer series. Then
    a) $v_1 - v_2 = v_3$ b) $v_1 = v_2 - v_3$ c) $\frac{1}{v_2} = \frac{1}{v_1} + \frac{1}{v_3}$ d) $\frac{1}{v_1} = \frac{1}{v_2} + \frac{1}{v_3}$

13. The orbital frequency of an electron in the hydrogen atom is proportional to
    a) n^3 b) n^{-3} c) n d) n^0

14. Given that in a hydrogen atom, the energy of nth orbit $E_n = -\frac{13.6}{n^2}$ eV. The amount of energy required to send electron from first orbit to second orbit is
    a) 10.2 eV b) 12.1 eV c) 13.6 eV d) 3.4 eV

15. The ratio of minimum to maximum wavelength in Balmer series is
    a) 5: 9 b) 5: 36 c) 1: 4 d) 3: 4

16. Which state of triply ionised beryllium (Be^{3+}) has the same orbital radius as that of ground state of hydrogen?
    a) $n = 3$ b) $n = 4$ c) $n = 1$ d) $n = 2$

17. The spin-orbit interaction has no effect in the level of the hydrogen atom
    a) s −level b) p −level c) d −level d) f −level

18. If the radii of nuclei of $_{13}Al^{27}$ and $_{30}Zn^{64}$ are R_1 and R_2 respectively, then $\frac{R_1}{R_2}$ is equal to
    a) $\frac{27}{64}$ b) $\frac{64}{27}$ c) $\frac{4}{3}$ d) $\frac{3}{4}$

19. For ionising an excited hydrogen atom, the energy required (in eV) will be
    a) A little less than 13.6 b) 13.6 c) More than 13.6 d) 3.4 or less

20. Let the PE of hydrogen atom in the ground state be zero. Then its total energy in the first excited state will be

a) 27.2 eV b) 23.8 eV c) 12.6 eV d) 10.2 eV