DPP

DAILY PRACTICE PROBLEMS

CLASS : XIITH **SUBJECT : PHYSICS**

DATE : **DPP NO. : 6**

Topic :-Atoms

1. Assuming f to be frequency of first line in Balmer series, the frequency of the immediate next(*ie*, second) line is

   a) 0.50 f b) 1.35 f c) 2.05 f d) 2.70 f

2. A charged particle q is shot towards another charged particle Q which is fixed, with a speed v. It approaches Q upto a closest distance r and then returns. If q was given a speed $2v$, the closest distance of approach would be

   a) r b) $2r$ c) $r/2$ d) $r/4$

3. Electrons in the atom are held to the nucleus by

   a) Coulomb's forces b) Nuclear forces

   c) Van der Waals' forces d) Gravitational forces

4. If the electron is a hydrogen atom jumps from an orbit with level $n_1 = 3$ to an orbit with level $n_1 = 2$, the emitted radiation has a wavelength given by

   a) $\lambda = \frac{36}{5R}$ b) $\lambda = \frac{5R}{36}$ c) $\lambda = \frac{6}{R}$ d) $\lambda = \frac{R}{6}$

5. The transition from the state n=4 to n=3 in a hydrogen like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition fro

   a) 2 →1 b) 3 →2 c) 4 →2 d) 5 →3

6. Imagine an atom made up of proton and a hypothetical particle of double the mass of electron, but having the same charge as that of electron. Apply the Bohr atom model and consider all possible transitions of this hypothetical particle to the first excited level. The longest wavelength photon that will be emitted has wavelength λ,(given in terms of Rydberg constant R for hydrogen atom) equal to

   a) $\frac{9}{5R}$ b) $\frac{36}{5R}$ c) $\frac{18}{5R}$ d) $\frac{4}{R}$

7. If the wavelength of the first line of the balmer series of hydrogen is 6561Å, the wavelength of the second line of the series should be
   a) 13122 Å b)3280 Å c) 4860 Å d) 2187 Å

8. Hydrogen atom excites energy level from fundamental state to $n = 3$. Number of spectrum lines, according to Bohr, is
   a) 4 b) 3 c) 1 d) 2

9. Number of neutrons in C^{12} and C^{14} are
   a) 8 and 6 b) 6 and 8 c) 6 and 6 d) 8 and 8

10. Ionization energy of He^{+} ion at minimum position is
    a) 13.6 eV b) 27.2 eV c) 54.4 eV d) 68.0 eV

11. Suppose an electron is attracted towards the origin by a force $\frac{k}{r}$, where k is constant and r is the distance of the electron from the origin. By applying Bohr model to this system, the radius of the nth orbital of the electron is found to be r_n and the kinetic energy of the electron to be T_n . Then which of the following is true?
    a) $T_n \propto \frac{1}{n^2}, r_n \propto n^2$ b) T_n independent of n, $r_n \propto n$
    c) $T_n \propto \frac{1}{n}, r_n \propto n$ d) $T_n \propto \frac{1}{n}, r_n \propto n^2$

12. The angular speed of the electric in the n th orbit of Bohr hydrogen atom is
    a) Directly proportional to n b) Inversely proportional to $\sqrt{n}$
    c) Inversely proportional to n^2 d) Inversely proportional to n^3

13. The first line of Balmer series has wavelength 6563 Å. What will be the wavelength of the first member of Lyman series?
    a)1215.4 Å b) 2500 Å c) 7500 Å d) 600 Å

14. Ionization potential of hydrogen atom is13.6 eV. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 eV. According to Bohr's theory, the spectral lines emitted by hydrogen will be
    a) Two b) Three c) Four d) One

15. Solar spectrum is an example for
    a) Line emission spectrum b) Continuous emission spectrum
    c) Band absorption spectrum d) Line absorption spectrum

16. The wavelength of the first spectral line in the Balmer series of hydrogen atom is 6561 Å. The wavelength of the second spectral line in the Balmer series of singly ionized helium atom is
    a) 1215 Å b) 1640 Å c) 2430 Å d) 4687 Å

17. The ionization energy of hydrogen atom is 13.6eV. Following Bohr's theory, the energy corresponding to a transition between 3rd and 4th orbit is
    a) 3.40 Ev b) 1.51 eV c) 0.85 eV d) 0.66 Ev

18. The nucleus of an atom consists of
    a) Electrons and protons b) Electrons, protons and neutrons
    c) Electrons and Neutrons d) Neutrons and protons

19. Electrons in a certain energy level $n = n_1$, can emit 3 spectral lines. When they are in another energy level, $n = n_2$, they can emit 6 spectral lines. The orbital speed of the electrons in the orbits are in the ratio
    a) 4:3 b) 3:4 c) 2:1 d) 1:2

20. Which of the following transition in Balmer series for hydrogen will have longest wavelength?
    a) n=2 to n=1 b) n =6 to n=1 c) n =3 to n=2 d) n =6 to n=2