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The Atomic Spectra
Chapter 18 MCQs

1. according to Bohr's of atomic structure, as long as an electron remains in a given orbit its energy:

- **Increases.**
- **Decreases.**
- **Remains constant.**

2. when an electron jumps from an outer to an inner orbit, the difference of energy between the two orbits is:

- **Emitted.**
- **Absorbed.**
- **Neither emitted nor absorbed.**

3. According to Bohr electron in an allowed orbit:

- **Radiates energy.**
- **Does not radiate energy.**
- **Obeys classical physics.**

4. The radius of first orbit of hydrogen is:

- **5.3 A^o.**
- 5.53 A^o.
- 53 A^o.
- 0.53 A^o.

5. The radius of third orbit of hydrogen is:

- 0.53 A^o.
- 3x0.53 A^o.
- 1/9 x 0.53 A^o.
- 9x0.53 A^o

6. Radius of n the orbit of hydrogen atom is given by:

- $R_n = 0.53\ A^o/n$.
- $R_n = 0.53\ A^o/n^2$.
- $R_n = n \times 0.53\ A^o$.
- $R_n = n^2 x 0.53\ A^o$.

7. Energy of electron in the ground state of hydrogen atom is:

- 13.6 eV.
- 13.6 eV.
- 1.36 eV.
- 1.36 eV.

8. Energy of electron in the nth orbit of hydrogen atom is:

- - nx 13.6 ev.
- $-n^2$x13.6 eV.
- -1/n x 13.6 eV.
- - $1/n^2$ x13.6 eV.

9. Lyman series lies in …… Region of hydrogen spectrum.

- Ultraviolet.
- Infra red.
- Visible.
- Far infra fed.

10. Ballmer series lies in ……region of hydrogen spectrum.

- Ultraviolet.
- Infra red.
- Visible.
- Far infra red.

11. Energy of electron in the first and second orbits of hydrogen atom is -13.6 eV and -3.4 eV respectively, the excitation energy for the second orbit of hydrogen atom (i.e. the energy required to send an electron from first to the second orbit) will be:

- 17.0 eV.
- -3.4 eV.
- -10.2 eV.
- 10.2 eV.

12. Energy of X-ray photon is ……the energy of photon of ultra violet light.

- Less than.
- Greater than.
- Equal to.

13. Flesh of our body is transparent to X-rays bur it is opaque to ordinary light, because:

- Visible light is electromagnetic in nature but x-rays are not.
- X-rays ravel faster than ordinary light.
- Visible light makes things visible but X-rays a not.
- Frequency of X-rays is much higher than that of ordinary light and hence they are more energetic and have higher penetrating power.

14. Transitions of electrons from the inner orbits of heavy elements results in the emission of:

- Ultra violet light.
- Y-rays.
- Infra red light.
- X-rays.

15. X-rays are produced by bombarding an element of high atomic weight by:

- Electrons.
- Protons.
- Neutrons.
- Y-rays.

16. Paschal series lies in ……..region of hydrogen spectrum:

- Ultraviolet.
- Infra red.
- Visible.
- Far infra red.

17. Bracket series lies in ……region of hydrogen spectrum.

- Ultraviolet.
- Infra red.
- Visible.
- Far infra red.

18. Pfund series lies in……..region of hydrogen spectrum.

- Ultraviolet.
- Infra red.
- Visible.
- Far infra red.

19. If h is the planks constant then according to Bohr's theory of atomic structure, electrons can revolve around the nucleus only in those orbits for which its angular momentum is an integral multiple of:

- H.
- H/2.
- H/2Л.
- H/3 Л.

20. According to Bohr's theory when electron jumps from an outer (p) to an inner (n) orbit, it emits the difference of energy in the form of a photon of light of frequency v given by:

- $E_p - E_n = hv$.
- $E_p + En = hv$.
- $E_n - E_p = hv$.
- None of these.

21. X-rays were discovered by:

- J.J. Thomson.
- Rydberg.
- Einstein.
- Roentgen.

22. Highly intense, monochromatic and coherent beam of light obtained by stimulating atoms of a suitable material is called:

- X-rays.
- Ultraviolet rays.
- Y-rays.
- Laser.

23. Ballmer series is obtained when all the transitions of electrons terminate on: (8-a, 2001)

- 3 rd. orbit.
- 4th, Orbit.
- 2nd. Orbit.
- 1st. orbit.

24. The laser is a device which we can produce: (8-a, 2001)

- An intense beam of light.
- A coherent beam of light.
- A monochromatic beam of light.
- All of the above.

25. The wave length of X-rays is in the range of:

- 0.01 nm to 0.1 nm.
- 1 A to 100 A.
- 0.1. A to 1 m.
- 0.1 nm to 1.0 nm.

ANSWERS

(1) Remains constant.
(2) Emitted.
(3) Does not radiate energy.
(4) 0.53 A^o.
(5) 9x0.53 A^o.
(6) $R_n = n^2$x0.53 A^o.
(7) -13.6 eV.
(8) $– 1/n^2$x13.6 eV.
(9) Ultraviolet.
(10) Visible.
(11) 10.2 eV.
(12) Greater than.
(13) Frequency of X-rays is much higher than that of ordinary light and hence they are more energetic and have higher penetrating power.
(14) X-rays.
(15) Electrons.
(16) Infra red.
(17) Far infra red.
(18) Far infrared.
(19) H/2Π.
(20) $E^p – E_n = hv$.
(21) Roentgen.
(22) Laser.
(23) 2nd. Orbit.
(24) All of the above.
(25) 0.1 nm to 1 nm.