

QUESTIONS FROM CBSE PREVIOUS YEARS BOARD EXAMINATIONS/SAMPLE PAPERS

MULTIPLE CHOICE QUESTIONS (MCQs)

1. When an electron in an atom moves from the ground state to a higher energy level, what happens to its kinetic and potential energies?

	Kinetic Energy	Potential Energy
(a)	increases	increases
(b)	increases	decreases
(c)	decreases	increases
(d)	decreases	decreases

(CBSE Practice Question 2023-24)

2. The emission spectrum of an element is the spectrum of frequencies of *em* radiations emitted due to electrons making a transition from a higher energy state to a lower energy state. The diagram below shows electrons transitioning from higher energy states to lower energy states.

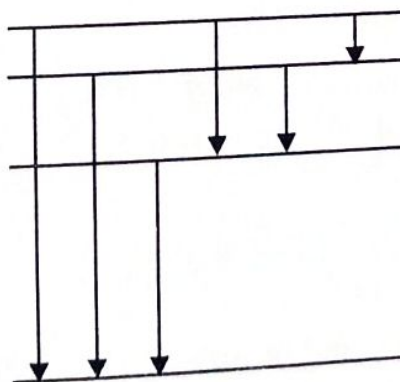
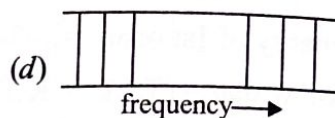
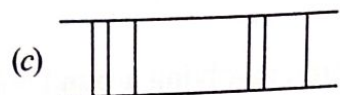
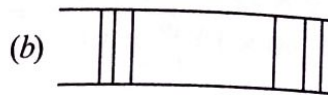
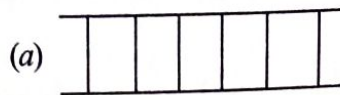


Fig. 12.24

Which of the following spectrums most closely corresponds to the above transitions?



(CBSE Practice Question 2023-24)

3. Each of the statements below are based on the properties of electron orbits in a hydrogen atom. Identify a statement that correctly satisfies the Bohr's model of an atom.

- (a) The angular momentum of the orbiting electron is $3h/\pi$.
 (b) The potential energy of the electron in any stable orbit is positive
 (c) The radius of the second electron orbit is $2a_0$, where a_0 is Bohr's radius.
 (d) An amount of energy -3.4 eV given to an electron in its second orbit will let it escape the atom.

(CBSE Practice Question 2022-23)

4. When alpha particles are sent through a thin gold foil, most of them go straight through the foil, because

- (a) alpha particles are positively charged
 (b) the mass of an alpha particle is more than the mass of an electron
 (c) most of the part of an atom is empty space
 (d) alpha particles move with high velocity

(CBSE Sample Question Paper 2023-24)

5. The energy of an electron in n th orbit of hydrogen atom is $E_n = -13.6/n^2$ eV. The negative sign of energy indicates that

- (a) electron is free to move
 (b) electron is bound to the nucleus
 (c) kinetic energy of electron is equal to potential energy of electron
 (d) atom is radiating energy

(CBSE Sample Question Paper 2023-24)

6. The radius of the innermost electron orbit of a hydrogen atom is 5.3×10^{-11} m. The radius of the $n = 3$ orbit is

- (a) 1.01×10^{-10} m (b) 1.59×10^{-10} m (c) 2.12×10^{-10} m (d) 4.77×10^{-10} m

(CBSE Sample Question Paper 2022-23)

7. The radius of the n^{th} orbit in Bohr model of hydrogen atom is proportional to :

- (a) $\frac{1}{n^2}$ (b) $\frac{1}{n}$ (c) n^2 (d) n

(CBSE 2023)

8. Hydrogen atom initially in the ground state, absorbs a photon which excites it to $n = 5$ level. The wavelength of the photon is :

- (a) 975 nm (b) 740 nm (c) 523 nm (d) 95 nm (CBSE 2023)

9. A hydrogen atom makes a transition from $n = 5$ to $n = 1$ orbit. The wavelength of photon emitted is λ . The wavelength of photon emitted when it makes a transition from $n = 5$ to $n = 2$ orbit is

- (a) $\frac{8}{7} \lambda$ (b) $\frac{16}{7} \lambda$ (c) $\frac{24}{7} \lambda$ (d) $\frac{32}{7} \lambda$ (CBSE 2023)

10. The ratio of maximum frequency and minimum frequency of light emitted in Balmer series of hydrogen spectrum, in Bohr's model is:

$$(a) \frac{11}{9}$$

$$(b) \frac{9}{5}$$

$$(c) \frac{11}{7}$$

$$(d) \frac{16}{7} \quad (\text{CBSE 2023})$$

11. The potential energy of an electron in the second excited state in hydrogen atom is :

$$(a) -3.4 \text{ eV}$$

$$(b) -3.02 \text{ eV}$$

$$(c) -1.51 \text{ eV}$$

$$(d) -6.8 \text{ eV} \quad (\text{CBSE 2023})$$

12. The diagram shows (see fig. 12.25) four energy level of an electron in Bohr model of hydrogen atom. Identify the transition in which the emitted photon will have the highest energy.

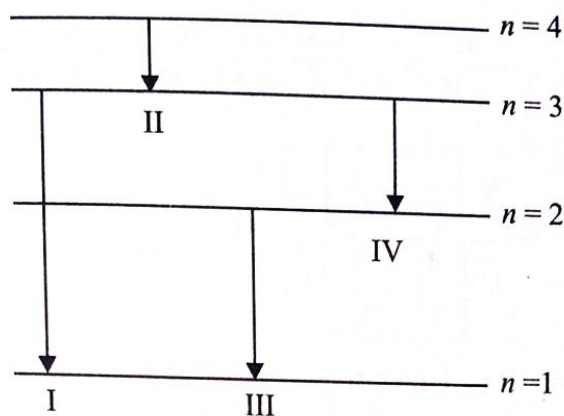


Fig. 12.25

$$(a) \text{ I}$$

$$(b) \text{ II}$$

$$(c) \text{ III}$$

$$(d) \text{ IV} \quad (\text{CBSE 2023})$$

13. The impact parameter for an alpha particle approaching a target nucleus is maximum when the scattering angle (θ) is:

$$(a) 0^\circ$$

$$(b) 90^\circ$$

$$(c) 180^\circ$$

$$(d) 45^\circ$$

(CBSE 2023 Comptt.)

14. Which of the following statements is not correct according to Rutherford model ?

(a) Most of the space inside an atom is empty.

(b) The electrons revolve around the nucleus under the influence of coulomb force acting on them.

(c) Most part of the mass of the atom and its positive charge are concentrated at its centre.

(d) The stability of atom was established by the model.

(CBSE 2020)

15. In Bohr's model of hydrogen atom, the total energy of the electron in n^{th} discrete orbit is proportional to:

$$(a) n$$

$$(b) \frac{1}{n}$$

$$(c) n^2$$

$$(d) \frac{1}{n^2} \quad (\text{CBSE 2020})$$

16. Paschen series of atomic spectrum of hydrogen gas lies in :

(a) Infrared region

(b) Ultraviolet region

(c) Visible region

(d) Partly in ultraviolet and partly in visible region

(CBSE 2020)

17. In the α -particle scattering experiment, the shape of the trajectory of the scattered α -particles depend upon :

(a) only on impact parameter.

(b) only on the source of α -particles.

(c) both impact parameter and source of α -particles.

(d) impact parameter and the screen material of the detector.

(CBSE 2020)

ANSWERS