Q.1 The absorption transition between the first and the fourth energy states of hydrogen atom are 3. The emission transitions between these states will be,

(A)3 **(B)**4 **(C)**5 **(D)**6

Q.2 Which of the following statement is true regarding the hydrogen spectral series?

(A)ALyman series is a continuous spectrum and the wavelength range lies in the Ultraviolet region.

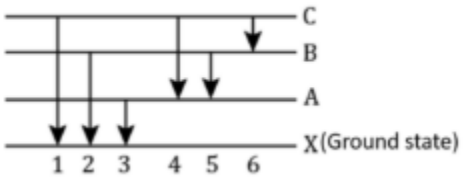
(B) Paschen series is a line spectrum and the wavelength range lies in the Infrared region.

(C) Balmer series is a line spectrum and the wavelength range lies in the Ultraviolet region.

(D) The spectral series formula can be derived from the Rutherford model of the atom.

Q.3 The figure indicates the energy level diagram of an atom and the origin of six spectral lines in emission example– line number 5 arises from the transition level B to A). Which of the following spectral lines will also occur in the absorption spectrum?

(A)1, 4, 6 **(B)**4, 5, 6 **(C)** 1, 2, 3 **(D)**1, 2, 3,4,5,6

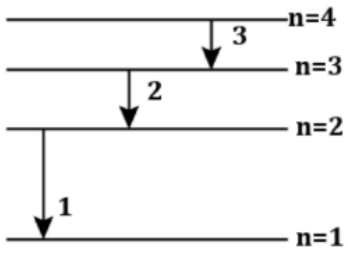


Q.4 The ionization energy of **10** times ionized sodium atom is:?

(A)13.6 eV **(B)**149.6 eV **(C)**1.236 eV **(D)**1645.6 eV

Q.5 in the figure representing the transition of electron from higher to lower state of a hydrogen atom. Which transition represents the line of balmer series?

(A)1 **(B)**2 **(C)**3 **(D)**all 1, 2 and 3



Q.6 An electron of stationary hydrogen atom passes from the fifth energy level to the ground lend. The velocity that the atom of mass m acquired as result of photon emission will be - : (Assume R is Rydberg constant and h is Planck's constant)?

(A)$\frac{24\text{hR}}{25\ m}$ **(B)**$\frac{25\text{hR}}{24\ m}$ **(C)**$\frac{25\text{m}}{24\ hr}$ **(D)**$\frac{24\text{m}}{25\ hr}$

Q.7 Minimum excitation potential of Bohr's first orbit in hydrogen atom is

(A)13.6 V **(B)**3.4 V **(C)**10.2 V **(D)**3.6 V

Q.8 An electron of the kinetic energy 10 eV collides with a hydrogen atom in 1st excited state. Assuming loss of K.E in the collision to be quantized which of the following statement is incorrect.

(A) The collision must be perfectly inelastic **(B)**The collision must be inelastic

(C) The collision must be elastic **(D)**The collision may be elastic or inelastic

Q.9 The wavelength of the energy emitted when the electron comes from fourth orbit to second orbit in hydrogen is 20.397 cm. The wavelength of energy for the same transition in He+ is?

(A)5.099 cm **(B)**20.497 cm **(C)**40.994 cm **(D)**81.998 cm

Q.10 an electron jumps from the 4^{th} orbit to the 2^{nd} orbit of hydrogen atom, then the frequency of the emitted radiation will be (Rydberg's constant, $R = 10^5 cm^{-1}$).

(A) $\frac{3}{16} \times 10^{15}$ Hz **(B)** $\frac{8}{16} \times 10^{15}$ Hz **(C)** $\frac{9}{16} \times 10^{15}$ Hz **(D)** $\frac{3}{4} \times 10^{15}$ Hz

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(D)	(B)	(C)	(D)	(B)	(A)	(C)	(D)	(A)	(C)