Dear student following is an Easy level [● ○ ○] test paper. Score of 19 Marks in 10 Minutes would be a satisfactory performance. Questions 1- 8 (+3, –1). (Only one option is correct)

Q.1 The spectrum of He is expected to be similar to that of :

(A) H (B) Li^+ (C) Na (D) He^+

Q.2 Which of the following electron transition in a hydrogne atom will require the largest amount of energy ?

(A) From n = 1 to n = 2

(B) From n = 2 to n = 3

(C) From n = ∞ to n = 1

(D) From n = 3 to n = 5

Q.3 Which of the following statements is not true ?s

(A) Lyman spectral series of hydrogen atom lies in the ultraviolet region of electromagnetic radiation

(B) Balmer spectral series of hydrogen atom lies in the visible region of electromagnetic radiation

(C) Pashen spectral series of hydrogen atom lies in the visible region of electromagnetic radiation

(D) Brackett spectral series of hydrogen atom lies in the infrared region of electromagnetic radiation

Q.4 The first emission line in the atomic spectrum of hydrogen in the Balmer series apears at :

(A) $\frac{9R}{400}cm^{-1}$ (B) $\frac{7R}{144}cm^{-1}$

(C) $\frac{3R}{4}cm^{-1}$ (D) $\frac{5R}{36}cm^{-1}$

Q.5 In Balamer series of hydrogen atom spectrum which electronic transition causes third line ?

(A) Fifth Bohr orbit to second one

(B) Fifth Bohr orbit to first one

(C) Fourth Bohr orbit to second one

(D) Fourth Bohr orbit to first one

Q.6 What transition in the hydrogen spectrum would have the same wavelength as the Balamer transition, n = 4 to n = 2 in the He^+ spectrum ?

(A) n = 4 to n = 1

(B) n = 3 to n = 2

(C) n = 3 to n = 1

(D) n = 2 to n = 1

Q.7 The spectrum produced by white light is

(A) Emission spectrum

(B) Continuous spectrum

(C) Absorption spectrum

(D) Both emission and continuous spectrum.

Q.8 In hydroggen spectrum, the series of lines appearing in ultraviolet region of electromagnetic spectrum are called

(A) Lyman lines

(B) Balmer lines

(C) Pfund lines

(D) Brackett lines.

CHEMISTRY FOUNDATION (CLASS TEST 2/6) (ATOMIC STRUCTURE) ANSWER KEY

Name : .... Roll No. : ....

	A	B	C	D		A	B	C	D		A	B	C	D
1	⬭	⬭	⬭	⬭	4	⬭	⬭	⬭	⬭	7	⬭	⬭	⬭	⬭
2	⬭	⬭	⬭	⬭	5	⬭	⬭	⬭	⬭	8	⬭	⬭	⬭	⬭
3	⬭	⬭	⬭	⬭	6	⬭	⬭	⬭	⬭					

ANSWER KEY

Que.	1	2	3	4	5	6	7	8
Ans.	B	A	C	D	A	D	D	A

SOLUTIONS

Sol.1 (B)

He and Li^+ contain two electrons each.

Sol.2 (A) Energy is released for n = ∞ to 1 and energy difference is maximum between n = 1 and n = 2 .

Sol.3 (C)

Paschen spectral series lies in the near infrared region of electromagnetic radiation.

Sol.4 (D)

$$\bar{v} = R\left(\frac{1}{2^2} - \frac{1}{3^2}\right)$$

($\because$ 1st line appears jump n = 3 to n = 2)

$$= \frac{5R}{36}\,cm^{-1}.$$

Sol.5 (A)

Ist line is for $n_3 \rightarrow n_2$

2nt line is for $n_4 \rightarrow n_2$

and 3rd line is for $n_s \rightarrow n_2$

$$\left[\text{Balmer} \quad \begin{matrix} n_3 \\ n_4 \\ n_5 \end{matrix} \rightarrow n_2 \right]$$

Sol.6 (D)

For He^s spectrum, for Balmer transition, n = 4 to 2

$$\bar{v} = \frac{1}{l} RZ^2\left(\frac{1}{2^2} - \frac{1}{4^2}\right) = R \times 4 \times \frac{3}{16} = \frac{3}{4}R$$

For H spectrum.

$$\bar{v} = \frac{1}{l} R \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right) = \frac{3}{4}R$$

or $\frac{1}{n_1^2} - \frac{1}{n_2^2} = \frac{3}{4}$

It is clear n_1 = 1 and n_2 = 2

Alternative Method:

For He^+, $\bar{v} = RZ^2\left(\frac{1}{2^2} - \frac{1}{4^2}\right)$

$$= R \times 4 \left(\frac{1}{2^2} - \frac{1}{4^2}\right) = R\left(\frac{1}{1^2} - \frac{1}{2^2}\right) \ldots (1)$$

For H, $\bar{v} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right) = R\left(\frac{1}{1^2} - \frac{1}{2^2}\right)$ ... (2)

Hence, n_1 = 1 and n_2 = 2

Sol.7 (D)

Sol.8 (D)