WEEKLY TEST MEDICAL PLUS -02 TEST - 04 RAJPUR
SOLUTION Date 14-07-2019

[CHEMISTRY]

70. Charge/mass for n = 0, for $\alpha = \frac{2}{4}$, for $p = \frac{1}{1}$, for $e^- = \frac{1}{1/1837}$

71

72. When an electron of charge e and mass m is accelerated with a potential difference V volts. K.E. = eV

$\Rightarrow \frac{1}{2}mv^2 = eV$ or $v^2 = \frac{2eV}{m}$

$\Rightarrow v = \sqrt{\frac{2eV}{m}}$.

73. $v \propto \frac{Z}{n}; r \propto \frac{n^2}{Z};$

74.

75. Total energy of third shell $= \frac{-13.6}{3^2}$

= – 1.51 eV
K.E. = – Total energy $\Rightarrow$ 1.51 eV
P.E. = 2 × T.E. = – 3.02 eV

76. Frequency of revolution $= \frac{\text{velocity in second orbit}(V_2)}{2\pi r_2}$

$= \frac{1.82\times10^6 \text{ ms}^{-1}}{2\times\pi\times\left(2.12\times10^{-10}\right)\text{m}} = 8.2\times10^{14} \text{ s}^{-1}$

77.

78. $\frac{1}{\lambda} = RZ^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right] = R\times3^2\left[\frac{1}{1^2} - \frac{1}{2^2}\right]$

$\Rightarrow$ R or $\lambda = \frac{1}{R}$

79. $\frac{1}{\lambda} = RZ^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right] = R\times2^2\left[\frac{1}{1^2} - \frac{1}{2^2}\right]$

$\Rightarrow$ 3R; $\lambda = \frac{1}{3R}$

80. Total number of spectral lines given by $\frac{1}{2}[n-1]\times n = 15$;

$\therefore$ n = 6

Thus, electron is excited upto 6th energy level from ground state. Therefore,

$$\frac{1}{\lambda} = R_H\left[\frac{1}{1^2} - \frac{1}{n^2}\right] = 109737 \times \frac{35}{36};$$

$\lambda = 9.373 \times 10^{-6}$ cm = 937.3 Å

81.

82.

83.

84.

85. $\frac{1}{\lambda} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$; $n_1 = 1$, $n_2 = ?$;

$$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{n_2^2}\right) \Rightarrow n_2^2 = \frac{R\lambda}{R\lambda - 1}$$

$$\Rightarrow \quad n_2 = \sqrt{\frac{\lambda R}{\lambda R - 1}}$$