**Model Question Paper**

Atomic physics - Part I

12th Standard

**Physics**

Reg.No. : | | | | | | |

I.Answer all the questions.

II.Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 80

## Part-A

5 x 1 = 5

1) According to Bohr's postuates,which of the following quantities take discrete values?

(a) kinetic energy (b) potential energy (c) angular momentum (d) momentum

2) The ratio of the radii of the first three Bohr orbit is,

(a) 1:1/2:1/3 (b) 1:2:3 (c) 1:4:9 (d) 1:8:27

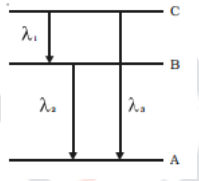
3) The first excitation potential energy or the minimum energy required to excite the atom from ground state of hydrogen atom is,

(a) 13.6eV (b) 10.2eV (c) 3.4eV (d) 1.89eV

4) According to Rutherford atom model ,the spectral lines emitted by an atom is,

(a) line spectrum (b) continuous spctrum (c) continuous absorption spectrum (d) band spectrum

5) Energy levels A,B,C of a certain atom correspond to increasing values of energy (i.g) $E_A < E_B < E_C$. if $\lambda_1, \lambda_2, \lambda_3$ are the wavelengths of radiations corresponding to the transitions C to B, B to A and Cto A respectively, which of the following statements is correct.




(a) $\lambda_3 = \lambda_1 + \lambda_2$ (b) $\lambda_3 = \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$ (c) $\lambda_1 = \lambda_2 + \lambda_3 = 0$ (d) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

## Part-B

5 x 3 = 15

6) What are cathode rays?

7) What is meant by energy level diagram?

8) Define: excitation potential energy and ionization potential energy.

9) What are X-rays?

10) What are hard X-rays and soft x-rays?

## Part-C

6 x 5 = 30

11) Write the properties of cathode rays?

12) Write the properties of X-rays?

13) state and obtain Bragg's law.

14) Explain the origin of characteristic X-rays?

15) a) Describe Rutherford's α-particle scattering experiment.

**(OR)**

b) Explain how a Bragg's spectrometer can be used to determine the wavelength of X-rays.

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