

Time : 1 hour 30 Minute

STD 9 Science
Chapter Based Test

Total Marks : 50

section A

* Choose the correct option from the given options [7]

- Value representing the number of protons in an element:
(A) Atomic Number (B) Valence Electrons (C) Mass Number (D) A and B
- Which of the following atom doesn't have its valency as one:
(A) Lithium (B) Hydrogen (C) Magnesium (D) Sodium
- In Rutherford's α -rays scattering experiment, gold foils are used because of _____?
(A) High malleability (B) Ductility (C) High melting point (D) High ionisation energy
- The atomic number of an element is 13 and its mass, mass number is 27. The correct order representing the number of electrons, protons and neutrons respectively in this atom is:
(A) 13, 13, 14 (B) 14, 13, 13 (C) 27, 13, 13 (D) 27, 14, 13
- When fast moving alpha particles are made to fall on a thin gold foil, most of them go straight through the foil because:
(A) Alpha particles are much heavier than electrons (B) Alpha particles are positively charged (C) Most part of the atom is empty space (D) Alpha particles move with high velocity
- The atomic numbers of four elements A, B, C and D are 12, 13, 15 and 3 respectively. The element which cannot form a cation is:
a. A
b. B
c. C
d. D
- Four elements W, X, Y and Z contain 8, 11, 9 and 17 protons per atom respectively. The element which cannot form an anion is most likely to be:
a. W
b. X
c. Y
d. Z

* Fill in the blank with correct answer [4]

- Fill in the blanks in the following statements:
Neon and chlorine have atomic numbers 10 and 17 respectively. Their valencies will be _____ and _____ respectively.
- Fill in the blanks in the following statements:

An atom of an element has 11 protons, 11 electrons and 12 neutrons. The atomic mass of the atom is _____.

10. Fill in the following blanks in respect of an atom of an element:

Number of protons	Number of neutrons	Mass number	Atomic number	Number of electrons	Valency
11	12

11. Fill in the blanks in the following statements:

The subatomic particle not present in a hydrogen atom is _____.

*** Do as directed**

[3]

12. Which subatomic particle is not present in an ordinary hydrogen atom?
13. An element has atomic number 13 and an atomic mass of 27. How many electrons are there in each atom of the element?
14. What are valence electrons? Where are valence electrons situated in an atom?

section B

*** Answer the Questions in brief**

[10]

1. Lithium atom has an atomic mass of 6u and three protons in its nucleus. How many neutrons does it have?
2. State the location of electrons, protons and neutrons in an atom.
3. Helium atom has 2 electrons in its valence shell but its valency is not 2, Explain.
4. The number of electrons in the outermost shell of chlorine is 7. What is its valency and why?
5. What is a proton? State its relative mass and charge.

section C

*** Answer the Questions in detail**

[12]

1. The ratio of the radii of hydrogen atom and its nucleus is ~ 10 . Assuming the atom and the nucleus to be spherical, If atom is represented by planet earth 'R e' = 6.4×10^6 m, estimate the size of the nucleus.
2. How cathode rays are different from anod rays?
3. An atom of an element has 17 proton, 17 electrons, and 18 neutrons.
- Calculate the mass number of the element.
 - Write its electronic configuration.
 - Find the valency and an atomic number of the element.
4. From the symbol ${}_{15}^{31}\text{P}$, state:
- Mass number of phosphorus.
 - Atomic number of phosphorus.
 - Electron configuration of phosphorus.

section D

* Answer the Questions in detail [5 marks each]

[10]

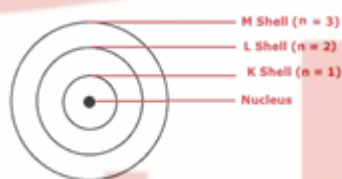
1. Compare all the proposed models of an atom given in this chapter.
2. The electronic configuration of an element Z is 2, 8, 8.
 - a. What is the atomic number of the element?
 - b. State whether element Z is a metal or a non-metal.
 - c. What type of ion (if any) will be formed by an atom of element Z? Why?
 - d. What is special about the outermost electron shell or the atom of this element?
 - e. Give the name and symbol of element Z.
 - f. Name the group of elements to which Z belongs.

Section E

* case study based question.

[4]

1.



Neils Bohr got the Nobel Prize for his work on the structure of atom in 1922. Among Professor Bohr's numerous writings, three appearing as books are: (i) The Theory of Spectra and Atomic Constitution, (ii) Atomic Theory and, (iii) The Description of Nature.

In order to overcome the objections raised against Rutherford's model of the atom, Neil's Bohr put forward the following postulates about the model of an atom:

- o Only certain special orbits known as discrete orbits of electrons, are allowed inside the atom.
- o While revolving in discrete orbits the electrons do not radiate energy. These orbits or shells are called energy levels. Energy levels in an atom are shown in Fig. A few energy levels in an atom These orbits or shells are represented by the letters K,L,M,N,... or the numbers, $n=1,2,3,4,....$

(1) The orbits or shells are represented by

- (a) Letters
- (b) Numbers
- (c) Both a & b
- (d) Special symbols

(2) These orbits or shells are called

- (a) Energy levels
- (b) Discrete orbit
- (c) Atomic levels
- (d) None of the above

(3) Which of the following book is written by Professor Bohr's

- (a) The Theory of Spectra and Atomic Constitution
- (b) Atomic Theory

(c) The Description of Nature

(d) All of the above

(4) Identify the correct statement

Statement 1 – The orbits or shells are represented by letters only.

Statement 2 – The orbits or shells are represented by numbers only.

Statement 3 – While revolving in discrete orbits the electrons do not radiate energy.

Statement 4 – Certain special orbits known as discrete orbits of electrons.

(a) Both 1 & 2

(b) Both 3 & 4

(c) Only 3

(d) All of the above

(5) Write the postulate of Neil's Bohr model of an atom?

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