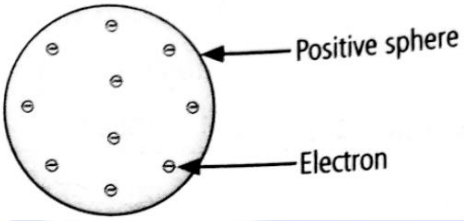
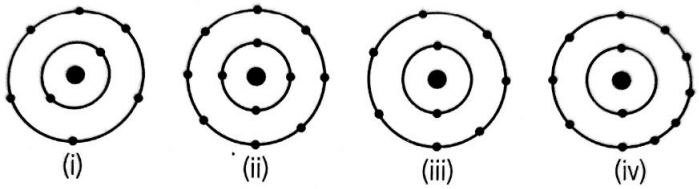
1. Who discovered electron?
   (a) E. Goldstein (b) Bohr (c) J. J. Thomson (d) J. Chadwick
2. Mass of proton is
   (a) equal to the mass of hydrogen atom (b) less than the mass of hydrogen atom
   (c) negligible (d) more than the mass of hydrogen atom.
3. Which statement is true?
   (a) The nucleus of an atom contains only neutrons.
   (b) The nucleus of an atom contains only protons and electrons.
   (c) Protons and neutrons are sub-atomic particles.
   (d) Protons have the same charge as neutrons.
4. Which model of an atom is depicted by the given figure?



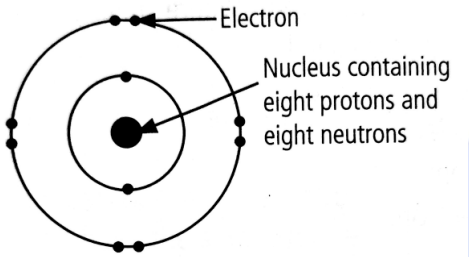
   (a) Thomson's model of an atom (b) Rutherford's model of an atom
   (c) Bohr's model of an atom (d) None of these
5. _____ was known as the 'Father' of nuclear physics. He is famous for his work on radioactivity and the discovery of the nucleus of an atom with the gold foil experiment.
   (a) J.J. Thomson (b) Neils Bohr (c) E. Rutherford (d) J. Chadwick
6. Select the correct statements.
   (i) The radius of the nucleus is about 10^7 times less than the radius of the atom.
   (ii) There is a positively charged centre in an atom called the nucleus. Nearly all the mass of an atom resides in the nucleus.
   (iii) The electrons revolve around the nucleus in circular paths.
   (iv) The size of the nucleus is very large as compared to the size of the atom.
   (a) (i) and (iv) (b) (ii) and (iii)
   (c) (i), (ii) and (iii) (d) All the statements are correct.
7. Neutrons are present in the nucleus of all atoms, except
   (a) hydrogen (b) helium (c) lithium (d) boron.
8. Rutherford's experiment on scattering of α-particles showed for the first time that the atom has
   (a) nucleus (b) electron (c) proton (d) neutron.
9. The main drawback of Rutherford's model of the atom is that
   (a) it does not explain the stability of atom
   (b) it does not show the location of protons
   (c) it does not explain neutral nature of an atom
   (d) it does not explain existence of a nucleus in an atom.

10. Which of the following do not represent Bohr's model of an atom correctly?



(a) (i) and (ii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (i) and (iv)

11. What is the particle shown in the diagram given below?



(a) F^- (b) N^{3-} (c) Ne (d) O^{2-}

12. Which pair of molecules has the same number of electrons?

(a) N_2 and F_2 (b) Cl_2 and CO_2 (c) H_2O and H_2S (d) O_2 and C_2H_4

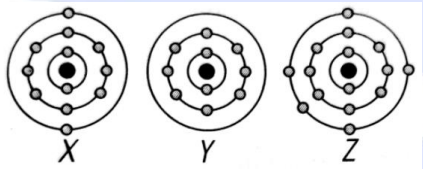
13. According to Bohr-Bury scheme, the maximum number of electrons which can be accommodated in a given shell is given by the formula

(a) $2n^2$ (b) n^2 (c) $3n^2$ (d) 2n

14. Atom X and atom Y have similar chemical properties. If the proton number of atom X is 12 , what is the likely proton number of atom Y ?

(a) 5 (b) 10 (c) 14 (d) 20

15. The schematic atomic structures of three elements X, Y and Z are given as:



Which of the following statements are incorrect?

I. Z can form ZCl_3 and ZCl_5.

II. Y exists in monatomic form.

III. X and Z combine to form X_3Z type compound.

IV. X and Y combine to form XY_2 type compound.

V. X will gain two electrons to form a stable compound.

(a) I and II (b) I, II and IV (c) II, IV and V (d) III, IV and V

16. The element with the atomic number 3 is likely to have similar chemical properties to the element with the atomic number

(a) 5 (b) 11 (c) 8 (d) 20

17. Which of the following has the same number of electrons as an oxide ion $\left(O^{2-}\right)$?

(a) K^{+} (b) Mg^{2+} (c) Cl^{-} (d) S^{2-}

18. The ion of an element has 2 positive çharges. Mass number of the atom is 24 and the number of neutrons is 12. What is the number of electrons in the ion?

(a) 8 (b) 10 (c) 12 (d) 24

19. An atom X achieves a stable electron structure by becoming an ion with formula X^{2-}. What is a possible electronic configuration of ion X^{2-} ?

(a) 2 (b) 2,2 (c) 2,6 (d) 2,8,8

20. Which statement is true about hydrogen-1 and hydrogen-3?

(a) They have no neutrons in the nucleus. (b) They have different chemical properties.

(c) They have different number of protons. (d) They have one electron outside the nucleus.

21. Isotopes of the same element have the same number of

(a) neutrons (b) protons

(c) protons and neutrons (d) protons, neutrons and electrons.

22. The number of protons, neutrons and electrons in four elements I, II, III and IV are as follows:

I. $p=6, n=6, e=6$ II $p=6, n=7, e=6$

III. $p=18, n=22, e=18$ IV. $p=19, n=21, e=19$

In these,

(a) elements I and II are isotopes and elements III and IV are isobars

(b) elements I and II are isotopes but elements III and IV are not isobars

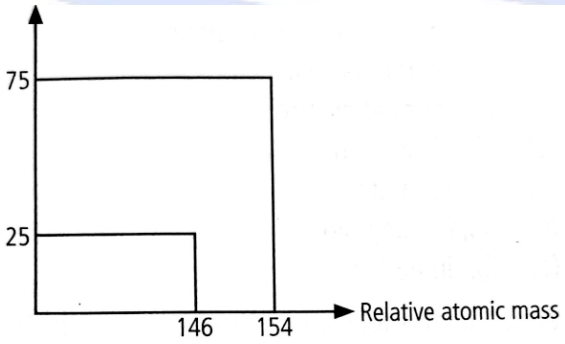
(c) elements I and II are isobars and element III and IV are isotopes

(d) elements I and II are isobars but elements III and IV are not isotopes.

23. An ion having a mass number 52 has 3 units of positive charge. The number of neutrons in the ion exceeds the number of electrons in it by 7 . The atomic number of the element is

(a) 28 (b) 22 (c) 26 (d) 24

24. An element E exists in two isotopic forms as shown below :



What is the relative atomic mass of E ?

(a) 150 (b) 152 (c) 151 (d) 153

25. The number of electrons in an element X is 15 and the number of neutrons is 16 . Which of the following is the correct representation of the element?

(a) ${}^{31}_{15}X$ (b) ${}^{31}_{16}X$ (c) ${}^{16}_{15}X$ (d) ${}^{15}_{16}X$

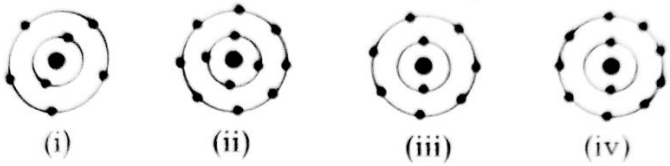
26. Which of the following are true for an element?
(i) Atomic number =number of protons + number of electrons
(ii) Mass number=number of protons + number of neutrons
(iii) Atomic mass= number of protons =number of neutrons
(iv) Atomic number= number of protons = number of electrons
(a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (ii) and (iv)

27. In the Thomson's model of atom, which of the following statements are correct?
(i) The mass of the atom is assumed to be uniformly distributed over the atom.
(ii) The positive charge is assumed to be uniformly distributed over the atom.
(iii) The electrons are uniformly distributed in the positively charged sphere.
(iv) The electrons attract each other to stabilise the atom.
(a) (i), (ii) and (iii) (b) (i) and (iii) (c) (i) and (iv) (d) (i), (iii) and (iv)

28. The ion of an element has 3 positive charges. Mass number of the atom is 27 and the number of neutrons is 14 . What is the number of electrons in the ion?
(a) 13 (b) 10 (c) 14 (d) 16

29. The first model of an atom was given by
(a) N. Bohr (b) E. Goldstein (c) Rutherford (d) J.J. Thomson.

30. Which of the following in Fig. 4.2 do not represent Bohr's model of an atom correctly?



(a) (i) and (ii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (i) and (iv)

31. Atomic models have been improved over the years. Arrange the following atomic models in the order of their chronological order
(i) Rutherford's atomic mode (ii) Thomson's atomic model
(iii) Bohr's atomic model
(a) (i), (ii) and (iii) (b) (ii), (iii) and (i) (c) (ii), (i) and (iii) (d) (iii), (ii) and (i)

Assertion-Reason Codes:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

32. Assertion: The atoms of different elements having same mass number but different atomic numbers are known as isobars.
Reason: The sum of protons and neutrons, in the isobars is always different.

33. Assertion: Thomson's atomic model is known as 'raisin pudding model.
Reason: The atom is visualized as a pudding of positive charge with electrons (raisins) embedded in it.

34. Assertion: Thomson's atomic model is known as 'raisin pudding model.
Reason: The atom is visualized as a pudding of positive charge with electrons (raisins) embedded in it.

35. Assertion: Electrons moving in the same orbit will lose or gain energy.
    Reason: On jumping from higher to lower energy level, the electron will gain energy.
36. Assertion: The mass of the total number of protons and neutrons is a measure of the approximate mass of an atom.
    Reason: The mass of an electron is negligible.
37. Assertion: Isotopes are electrically neutral.
    Reason: Isotopes of an element have equal number of protons and electrons.
38. Assertion: Isotopes of an element show different valencies.
    Reason: Isotopes have different atomic numbers.