

ATOM and ITS STRUCTURE (Multiple Choices)

1. Which property of an element always remains unchanged when it forms a compound?

- A. Chemical properties
- B. Physical state
- C. Number of protons in its atom
- D. Number of electrons in its atom
- E. Color of the atom

2. Which of the following statements is wrong for the structure of an atom?

- A. Protons and neutrons are at the center
- B. Electrons move around the nucleus
- C. Electrons are negatively charged particles
- D. Neutrons are positively charged particles
- E. Mass of one proton is equal to mass of one neutron

3. Which of the following statements is (are true for the structure of an atom?

- I. Volume of a nucleus is smaller than volume of its atom
 - II. Atomic mass number is the sum of proton and neutron numbers
 - III. Atomic number is the sum of protons and electrons
- A. I only
 - B. II only
 - C. III only
 - D. I and II
 - E. I, II and III

4. Which one of the following is the correct electron configuration of ${}_{38}\text{Sr}$?

- A. 2 8 18 10
- B. 2 8 20 8
- C. 2 8 18 8 2
- D. 2 8 18 9 1 5
- E. 8 18 10 2

5. Which one of the following ions has different electron configuration than other ions?

- A. ${}_{13}\text{Al}^{+3}$
- B. ${}_{19}\text{K}^{+1}$
- C. ${}_{17}\text{Cl}^{-1}$
- D. ${}_{20}\text{Ca}^{+2}$
- E. ${}_{16}\text{S}^{-2}$

- 6. I. Proton number
- II. Neutron number
- III. Chemical properties
- IV. Physical properties

Which of the above is (are different for isotopes)?

- A. II only
- B. III only
- C. I and IV
- D. II and III
- E. II and IV

- 7. I. They have the same chemical properties
- II. They have different physical properties
- III. They contain different types of atoms

Which one of the given statements is/are correct for allotropes?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I, II and III

8. Which of the following statements is wrong?

- A. Atomic number is equal to proton number.
- B. Atomic mass number is equal to the sum of proton and neutron numbers.
- C. Proton and electron numbers of a neutral atom are the same.
- D. Mass of a proton and mass of an electron are the same.
- E. Mass of a neutron is equal to mass of a proton.

9. Which of the following is (are) true?

- I. Neutral atoms have negative charge
 - II. For a neutral atom, proton number is always equal to electron number
 - III. Cations are positively charged ions
- A. I only
 - B. II only
 - C. III only
 - D. I and II
 - E. II and III

10. Which of the following is the correct order for the classifications of Na^{1+} , O^{2-} , Ag ?

- A. Neutral atom, anion, cation
- B. Neutral atom, cation, anion
- C. Cation, anion, neutral atom
- D. Cation, neutral atom, anion
- E. Anion, cation, neutral atom

11. Which one of the following is the correct electron configuration of ${}_{10}\text{Ne}$?

- A. 2) 8) 18)
- B. 2) 8)
- C. 2) 8) 10)
- D. 2) 8) 2)
- E. 8) 2)

12. Which one of the following atoms has the greatest atomic mass number?

	Atom	Proton	Electron	Neutron
A.	X	20	18	20
B.	Y	17	19	18
C.	Z	19	19	20
D.	T	16	18	16

13. Which statement(s) given below is/are true?

- I. Compounds contain different kinds of atoms
- II. Elements consist of the same kind of atoms.
- III. There are only protons and neutrons in an atom.

- A. I only
- B. I and II
- C. II and III
- D. I and III

14. Which of the following is (are) true?

- I. Neutral atoms have negative charge
- II. For a neutral atom, proton number is always equal to electron number
- III. Cations are positively charged ions

- A. I only
- B. II only
- C. III only
- D. II and III

15.

- I. Proton number
- II. Neutron number
- III. Chemical properties
- IV. Physical properties

Which of the above is (are) different for isotopes?

- A. II only
- B. III only
- C. I and IV
- D. II and IV

16. Which one is wrong for isotope atoms ?

- A. They have same number of protons.
- B. They have different number of neutrons.
- C. They have same chemical properties.
- D. They have different physical properties.

17.

Atom	Neutron number	Atomic mass number
X	20	37
Y	18	35
Z	20	39

According to the table given above, which atoms are isotopes of each other?

- A. X and Y
- B. X and Z
- C. Y and Z
- D. none of them

18. Which one of the following can be an isotope of ${}^{24}_{12}\text{X}$?

_____ atom proton # atomic mass #

- A. A 10 24
- B. B 11 24
- C. C 11 25
- D. D 12 25

19. Consider an ion of element A with 6 protons, 4 electrons and 6 neutrons. An isotope of A must have

- A. 4 electrons
- B. 6 electrons
- C. 8 electrons
- D. 6 protons

20. Select the combination of electrons, protons and neutrons which can make up a positively charged ion.

	Electron	Proton	Neutron
A.	2	3	4
B.	5	5	5
C.	10	8	8
D.	13	13	14

21. Select the combination of electrons and protons which can make up a negatively charged ion?

	Electron	Proton
A.	3	4
B.	5	5
C.	6	6
D.	4	3

22. Which one of the following ions has the charge of (-3)?

	p	n	e
A.	7	7	10
B.	13	14	10
C.	12	12	10
D.	15	16	10

23.

Atom	Proton	Electron	Neutron
X	17	17	18
Y	17	18	20
Z	18	18	20

Which one is wrong according to the given table?

- A. The heaviest one is Z.
- B. Atomic number of X is 17.
- C. Y is an ion.
- D. X and Z are isotopes.

24. Which of the following statements is false for ${}^{24}_{12}\text{Mg}^{2+}$?

- A. It has 12 neutrons
- B. It has 12 protons
- C. Its atomic mass number is 36
- D. It has 10 electrons
- E. Its atomic number is 12

25. The atomic number of a neutral atom is 12. Which of the following statements is exactly true about this atom?

- I. It has 12 protons
 - II. Its mass number is 24
 - III. It has 12 neutrons
 - IV. It has 12 electrons
- A. I only
 - B. III only
 - C. II and III
 - D. I and IV
 - E. I, III and IV

26. Which of the following statement is wrong?

- A. The outer most shell is called valence shell.
- B. There can be eight electrons at most in the valence shell of an atom.
- C. Electron capacity of the first shell is 2.
- D. Noble gases have eight valence electrons (except He)
- E. All metals have two electrons in their valence shells.

27. Which one of the following statements is false for a positively charged ion that has 19 protons and atomic mass number of 39?

- A. There are 20 neutrons.
- B. It is a nonmetal.
- C. Its atomic number is 19.
- D. There are less than 19 electrons.
- E. This element is a cation.

28. About structure of atom:

- I. Protons and neutrons are placed in nucleus
- II. Atomic mass is the summation of proton number and neutron number
- III. Atomic number is the summation of proton, neutron and electron numbers

Which of the above statements is/are true?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. II and III

29. Number of proton (P), number of neutrons (n), number of electrons (e) for an atom. Which one is the correct relation between P, n and e for $^{23}_{11}\text{Na}^{1+}$?

- A. $n > P > e$
- B. $P = n > e$
- C. $e > n > P$
- D. $e > P > n$
- E. $e > P = n$

30. About an X atom which electron configuration finishes with $3p^4$ orbital:

- I. There are totally 6 electrons at s orbital
 - II. There are 7 full filled and 2 half-filled orbitals
 - III. It may take -2 and +6 charge in its compounds
- Which statement(s) is/are true?

- A. I only
- B. I and II
- C. I, II and III
- D. II and III
- E. III only

31. About $^{55}_{26}\text{Fe}^{2+}$ and $^{56}_{26}\text{Fe}^{3+}$ ions:

- I. Their chemical properties are the same
- II. Their physical properties are different
- III. Neutron numbers of them are the same
- IV. They are isotones atoms

Which statement(s) is/are wrong?

- A. I only
- B. III only
- C. I and III
- D. II and IV
- E. II, III and IV

32. Isotope atoms have the same atomic number and different atomic mass. About the structure of two atoms which are isotopes:

- I. Their proton numbers is different but electron numbers are the same.
- II. Their proton and neutron number are different
- III. Their neutron numbers are different, electron number are the same.

Which statement(s) is/are true?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I and III

33. The nr of proton, neutron and electron for X, Y and Z atoms are given below:

	Proton number	Neutron number	Electron number
X	9	9	10
Y	10	11	10
Z	11	10	10

Which one is true for X, Y and Z below?

	Anion	Cation	Neutral
A.	X	Y	Z
B.	X	Z	Y
C.	Z	Y	X
D.	Y	Z	X
E.	Z	X	Y

34. The atomic mass of X^{3-} ion, which has 18 electrons, is 32.

I. The number of protons is 15

II. The number of neutrons is 16

III. Electronic configuration is $1s^2 2s^2 2p^6 3s^2 3p^3$

Which of the above statement(s) is/are true for X atom?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I, II and III

35. For the atom of ^{52}Cr which has 28 neutrons:

I. Its atomic mass is 52 amu

II. Its atomic number is 24

III. The ion of Cr^{3+} has 21 protons

which of the statements given above is/are correct?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I, II and III

	A	n	p	e	q
X	35	18	-	-	0
Y	-	20	17	17	0
Z	36	18	-	18	0
T	24	12	-	-	0

Fill in the blanks completely in the table. Considering X, Y, Z and T atoms: Which of the statements is/are correct?

I. X and Y are isotopes of each other

II. The heaviest of them is Y

III. The compound of TY_2 is formed from Y and T

- A. I only
- B. II and III
- C. I and III
- D. I and II
- E. I, II and III

37. Which one is the same for all neutral atoms of an element in nature?

I. Atomic mass number

II. Proton number

III. Neutron number

- A. I only
- B. II only
- C. III only
- D. I and III
- E. II and III

38. The isotopes of hydrogen are ^1_1H , ^2_1D , ^3_1T and the isotopes of chlorine are $^{35}_{17}\text{Cl}$, $^{37}_{17}\text{Cl}$. What are the heaviest and lightest compounds formed between

isotopes of H and Cl?

The heaviest

A. ^3_1T and $^{35}_{17}\text{Cl}$

B. ^2_1D and $^{35}_{17}\text{Cl}$

C. ^3_1T and $^{37}_{17}\text{Cl}$

D. ^1_1H and $^{35}_{17}\text{Cl}$

E. ^3_1T and $^{35}_{17}\text{C}$

The lightest

^1_1H and $^{35}_{17}\text{Cl}$

^2_1D and $^{37}_{17}\text{Cl}$

^1_1H and $^{37}_{17}\text{Cl}$

^3_1T and $^{37}_{17}\text{Cl}$

^1_1H and $^{35}_{17}\text{Cl}$

39. Which of the statements is/are correct for the ions of X^{3-} and Y^{5+} which are iso-electronics?

I. X and Y are isotopes of each other

II. The atomic number of X is 9

III. Numbers of electrons are the same

- A. I only
- B. III only
- C. I and II
- D. II and III
- E. I, II and III

40. The neutral atoms of X^{3-} and Y^{5+} ions are isotopes. So, their

I. Charges of nuclei are the same

II. Atomic mass numbers are the same

III. Numbers of electrons are the same

which of the statements given above is/are correct for the ions of X^{3-} and Y^{5+} ?

- A. I only
- B. III only
- C. I and II
- D. II and III
- E. I, II and III

41.

I. Compounds contain different kinds of atoms.

II. Elements consist of the same kinds of atoms.

III. There are only protons and neutrons in an atom.

Which of the statement given above is/are correct?

- A. I only
- B. I and II
- C. II and III
- D. I and III
- E. I, II and III

42. The relations among the number of protons (p), the number of neutrons (n) and the number of electrons (e) are given below,

I. $p=e$ II. $p<n$ III. $e>n$

Which statements is/are correct for a neutral atom always?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I, II and III

43.

- I. All electrons are attracted equally by the nucleus.
- II. All electrons are at equal distances from nucleus.
- III. The attractive force of nucleus is only due to the protons.

Which of them is/are wrong for a neutral atom?

- A. I only
- B. II only
- C. III only
- D. I and II
- E. I, II and III

44. X and Y are isotopes. And their atomic masses are different.

The reasons of this difference are given as follow.

Which of them is/are correct?

- I. Difference in their number of electrons
- II. Difference of their number of protons
- III. Difference of their number of neutrons

- A. I only
- B. II only
- C. III only
- D. I and III
- E. II and III

45.

I. Negative ion is formed when electron is added to the X atom.

II. Positive ion is formed when electron is removed from the Y atom.

III. An isotope of Z is formed if a Z atom captures a neutron.

Which of them is/are correct for X, Y, Z atoms?

- A. I only
- B. II only
- C. I and II
- D. I and III
- E. I, II and III

46. If an X atom gives 3 electrons, it becomes X^{3+} which of the following can be deduced by using this information only?

- I. The differences between number of electrons and protons
- II. The total number of protons and neutrons.
- III. The difference between the charge of nucleus and ion.

- A. I only
- B. II only
- C. I and III
- D. II and III
- E. I, II and III

47. For the X^{2+} and X^{2-} ions of an atom X; which of the followings is/are certainly the same?

- I. The charge of nucleus
- II. The number of neutrons
- III. The number of electrons

- A. I only
- B. II only
- C. I and II
- D. II and III
- E. I, II and III

48. Consider the two ions of X, X^{1+} , and X^{1-} for the same atom

- I. Their numbers of neutrons are different
- II. They are arranged $X^{1-} > X > X^{1+}$ in order of number of electrons
- III. Their charges of nuclei are the same

Which of the statements is/are correct?

- A. I only
- B. II and III
- C. I and III
- D. I and II
- E. I, II and III

49. Which one of the followings is correct, for the numbers of protons, electrons and neutrons of NO_3^- ion ($^{14}_7N$, $^{16}_8O$)

	p	n	e
A.	15	15	16
B.	21	42	21
C.	30	30	31
D.	31	30	30
E.	31	31	32

50. For the ion of $^1_1H^{1-}$

I- It has one neutron and one proton

II- It has one proton and two electrons

III- It has one proton and one electron

which of the above statements is/are correct?

- A. I only
- B. II only
- C. I and II
- D. I and III
- E. III only

51. X^{2-} , Y^{1-} , Z^{1+} ions have the same number of electrons and their numbers of neutron are one more than their numbers of electrons. How can the neutral X, Y, Z be arranged in order of their atomic mass number?

- A. $Z > X > Y$
- B. $Z > Y > X$
- C. $X > Y > Z$
- D. $X > Z > Y$

E. $Y > X > Z$

52. For the neutral Sulfur atom which has 16 protons and 16 neutrons

I. The atomic number of S is 32

II. S^{2-} has 18 electrons

III. The charge of its nucleus is +16

Which of the above statements is/are wrong?

A. I only

B. II only

C. I and II

D. II and III

E. I and III

53. What is the atomic mass number of Fe^{3+} which has 23 electrons and 30 neutrons?

A. 50 B. 53 C. 56 D. 47 E. 55

54.

I. Negative ion is formed when electron is added to the X atom.

II. Positive ion is formed when electron is removed from the Y atom.

III. An isotope of Z is formed if a Z atom captures a neutron.

Which one is true for X, Y, Z atoms?

A. I only

B. II only

C. I and II

D. I and III

E. I, II and III

55.

For the atom of ${}_{52}Cr$ which has 28 neutrons :

I. Its atomic mass is 52 amu

II. Its atomic number is 24

III. The ion of Cr^{3+} has 21 protons
which statement is true?

A. I only

B. II only

C. III only

D. I and II

E. I, II and III