CBSE

CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES WS 1

Class 11 - Chemistry

Section A

1. Mendeleev arranged elements in a periodic table in order of their increasing atomic weights in such a way that the elements with similar properties occupies: **[1]**

   a) The same Horizontal row or series.
   b) The positions on the bottom left to top right diagonal.
   c) The same vertical column or group.
   d) The positions on the top left to bottom right diagonal.

2. Which important property did Mendeleev use to classify the elements in his periodic table? **[1]**

   a) Atomic weight
   b) Atomic number
   c) Atomic mass
   d) Melting point

3. Mendeleev's left the gap under aluminum and a gap under silicon having atomic weights 68 and 72 respectively. These elements respectively are **[1]**

   a) Aluminium and silicon
   b) Eka-germanium and Eka-silicon
   c) Eka-aluminium and Eka-silicon
   d) Eka-aluminium and Eka-germanium

4. According to Mendeleev's periodic law, the physical and chemical properties of elements are a periodic function of their _____. **[1]**

   a) atomic radii
   b) atomic numbers
   c) atomic masses
   d) empirical formulae

5. Which of the following is NOT a Dobereiner's triad? **[1]**

   a) Li, Na, K
   b) Cl, Br, I
   c) P, As, Sb
   d) Ca, Sr, Ba

6. It is now recognized that the 'Modern Periodic Law' is essentially the consequence of the: **[1]**

   a) periodic variation in chemical properties.
   b) periodic variation in electronic configurations.
   c) periodic variation in chemical bonds.
   d) periodic variations in the element lattice.

7. According to the recommendation of the International Union of Pure and Applied Chemistry (IUPAC), the groups in the modern periodic table are numbered from: **[1]**

   a) 1 to 18
   b) 1 to 10
   c) 1 to 12
   d) 1 to 8

8. In the modern periodic table: **[1]**

a) The horizontal rows are called groups and the vertical columns, periods.

b) The horizontal rows are called periods and the vertical columns, groups.

c) The horizontal rows are called series and the vertical columns, groups.

d) The horizontal rows are called periods and the vertical columns, series.

9. In terms of period and group, where would you locate the element with Z = 114 in the modern periodic table? **[1]**

a) 7th period and 14th group

b) 6th period 14th group

c) 6th period and 13th group

d) 7th period and 13th group

10. As per the modem periodic law, the physical and chemical properties of elements are periodic functions of their _____. **[1]**

a) atomic radii

b) atomic numbers

c) atomic masses

d) densities

11. In the modern periodic table, the period indicates the value of: **[1]**

a) azimuthal quantum number

b) principal quantum number

c) mass number

d) atomic number

12. The horizontal rows and the vertical columns in the periodic table are termed as respectively? **[1]**

a) series, periods

b) periods, groups

c) groups, periods

d) family, periods

13. The correct order for the increase in atomic radii is: **[1]**

a) I< Br< Cl < F

b) F< C< I< Br

c) C< Br< I

d) F< Cl < Br < I

14. According to IUPAC nomenclature,element Ununnillium have an atomic number of: **[1]**

a) 108

b) 109

c) 111

d) 110

15. The symbol and name according to the IUPAC system for the element with atomic number = 120, respectively are **[1]**

a) Ubn and unnilium

b) Ubn and unbiunium

c) Ubn and unnilbium

d) Ubn and unbinilium

16. The atomic number of the element unnilennium is: **[1]**

a) 102

b) 109

c) 119

d) 108

17. According to IUPAC, total number of groups and periods in the periodic table respectively are **[1]**

a) 18, 7

b) 13, 7

c) 16, 9

d) 18, 9

18. According to IUPAC nomenclature for elements with Z greater than 100, the root 'sept' corresponds to the digit: **[1]**

a) 4

b) 8

c) 3 d) 7

19. Atomic number of element Unnilhexium is: **[1]**

a) 105 b) 107

c) 110 d) 106

20. Eka-aluminium is known as _____. **[1]**

a) Aluminium b) Germanium

c) Iron d) Gallium

21. **Assertion (A):** According to Mendeleef, periodic properties of elements is a function of their atomic masses. **[1]**
Reason (R): Atomic number is equal to the number of protons.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

22. **Assertion (A):** Atomic number of the element ununbium is 112. **[1]**
Reason (R): Name for digits 1 and 2 is un - and bi - respectively in Latin words.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

23. The number of columns in the Modern periodic table in s, p, d, and f - blocks are respectively ___, ___, ___, ___. **[1]**

a) 14,10,6, 2 b) 6,2,10,14

c) 2,6,10,14

24. Which of the following statements is incorrect? **[1]**

a) Mendeleev's arranged elements in horizontal rows and vertical columns b) Mendeleev's arranged elements in order of their decreasing atomic number

c) Mendeleev's system of classifying elements was more elaborate than that of Lother Meyer d) Mendeleev's arranged elements in order of their increasing atomic number

25. Mendeleev proposed that some of the elements were still undiscovered and, therefore, left several gaps in the table. He left the gap under aluminium and a gap under silicon and called these elements Eka-Aluminium and Eka-Silicon. These were later discovered and named. **[1]**

a) Gallium and Godolinium respectively b) Barium and Germanium respectively

c) Mendelivium and Germanium respectively d) Gallium and Germanium respectively

26. Who was the first scientist to classify elements according to their properties? **[1]**

27. Why were the names eka-aluminium and eka-silicon given to galium and germanium by Mendeleev? **[1]**

28. Name the two elements whose existence and properties were predicted by Mendeleev though they did not exist then. **[1]**

29. What is the basis of triad formation of elements? **[1]**

30. State Mendeleev’s periodic law. **[1]**

31. X,Y and Z are three members of a Dobereiner's triad. If the atomic mass of X is 7 and that of Z is 39, what is the atomic mass of Y? **[1]**

32. State the modern ‘Periodic law’. **[1]**

33. Which two elements of the following belong to the same period? Al, Si, Ba and O **[1]**

34. What is the most important cause of periodicity? **[1]**

35. How many elements are known at present? **[1]**

36. What is the IUPAC name, official name and symbol of the element with atomic number 110? **[1]**

37. What would be the IUPAC name and symbol for the element with atomic number 120? **[1]**

Section B

38. What is the basic theme of organisation in the periodic table? **[2]**

39. Which important property did Mendeleev use to classify the elements in this periodic table and did he stick to that? **[2]**

40. How did Mendeleev arrange the elements? **[2]**

41. Write a short note on the need of classification of elements. **[2]**

42. Describe the main features of Mendeleev’s periodic table. **[2]**

43. What is the basic difference in approach between Mendeleev's periodic law and the Modern Periodic Law? **[2]**

44. On the basis of quantum numbers, justify that the sixth period of the periodic table should have 32 elements. **[2]**

45. State the modern periodic law. **[2]**

46. Give the general characteristics of the long form of Modern periodic table. **[2]**

47. How many elements can be accommodated in the present set up of the long form of the periodic table? Explain. **[2]**

48. Write the name and atomic number of the following elements. **[2]**

    i. The third alkali metal

    ii. The fourth alkaline earth metal

    iii. The sixth element of second transition series

    iv. The second inner transition element

    v. The fifth noble gas.

49. Write the atomic number of the element present in the third period and seventeenth group of the periodic table. **[2]**

50. In terms of period and group where will you locate the element with Z = 114? **[2]**

51. What are horizontal rows and vertical columns of the periodic table called? **[2]**

52. Eka-aluminium and eka-silicon were the names given by Mandeleev for the then-unknown elements gallium and germanium respectively. A recently discovered element was first named as eka-mercury. What is its atomic number? Write its group number, electronic configuration, IUPAC and official names. **[2]**

53. Which element do you think would have been named by: **[2]**

    i. Lawrence Berkeley Laboratory

    ii. Seaborg's group?

54. What would be IUPAC names and symbols for elements with atomic numbers 122, 127, 135, 149 and 150? **[2]**

Section C

55. **State True or False:** **[3]**

    (a) In Mendeleev's periodic table, all groups are divided into two subgroups. **[1]**

    (b) Zero group was not present in the periodic table when Mendeleev presented it. **[1]**

    (c) Mendeleev's periodic law was based on atomic numbers of the elements. **[1]**

56. What are Dobereiner's triads? Give an example. **[3]**

57. Arrange the following as stated. **[3]**

i. Increasing order of bond dissociation energy of N_2, O_2, F_2, Cl_2.

ii. Decreasing order of electropositive character of Cu, Fe, Mg.

iii. Increasing order of valency of nitrogen in HNO_3, HNO_2, NO_2.

58. What are Dobereiner's triads? Name two such triads. **[3]**

59. Write characteristics of all seven periods of the periodic table. **[3]**

60. Can an element with atomic number 126, if discovered, be accommodated in the present setup of the long form of periodic table? **[3]**

Section D

61. **Fill in the blanks:** **[5]**

(a) Law of octave was presented by _____. **[1]**

(b) The last member of the seventh period of the periodic table will be the element with atomic number _____. **[1]**

(c) In the periodic table, vertical rows are known as _____. **[1]**

(d) In the periodic table, horizontal rows are known as _____. **[1]**

(e) According to modern periodic law, properties of the elements are periodic function of their _____. **[1]**

62. Write a short note on Mendeleev's periodic table. **[5]**

63. i. Give the characteristics of Mendeleev’s periodic table **[5]**

ii. In what manner is the long form of periodic table better than Mendeleev’s periodic table? Explain with examples.

64. Discuss the drawbacks of Mendeleev’s periodic table that led to its modification. **[5]**

65. Discuss the main features of long form of the periodic table. What are the advantages of long form of periodic table? **[5]**

66. In what manner is the long form of periodic table better than Mendeleev’s periodic table? Explain with examples. **[5]**