ASSIGNMENT QUESTIONS SET – 2
CHAPTER – 5
PERIODIC CLASSIFICATION OF ELEMENTS

1. Upto which element, the Law of Octaves was found to be applicable

(a) Oxygen

(b) Calcium

(c) Cobalt

(d) Potassium

2. According to Mendeleev's Periodic Law, the elements were arranged in the periodic table in the order of

(a) increasing atomic number

(b) decreasing atomic number

(c) increasing atomic masses

(d) decreasing atomic masses

3. In Mendeleev 's Periodic Table, gaps were left for the elements to be discovered later. Which of the following elements found a place in the perioidc table later

(a) Germanium

(b) Chlorine

(c) Oxygen

(d) Silicon

4. Which of the following statement (s) about the Modern Periodic Table are incorrect

(i) The elements in the Modern Periodic Table are arranged on the basis of their decreasing atomic number

(ii) The elements in the Modern Periodic Table are arranged on the basis of their increasing atomic masses

(iii) Isotopes are placed in adjoining group (s) in the Periodic Table

(iv) The elements in the Modern Periodic Table are arranged on the basis of their increasing atomic number

(a) (i) only (b) (i), (ii) and (iii)

(c) (i), (ii) and (iv) (d) (iv) only

5. Which of the following statements about the Modern Periodic Table is correct:

(a) It has 18 horizontal rows known as Periods

(b) It has 7 vertical columns known as Periods

(c) It has 18 vertical columns known as Groups

(d) It has 7 horizontal rows known as Groups

6. Which of the given elements A, B, C, D and E with atomic number 2, 3, 7, 10 and 30 respectively belong to the same period?

(a) A, B, C

(b) B, C, D

(c) A, D, E

(d) B, D, E

7. The elements A, B, C, D and E have atomic number 9, 11, 17, 12 and 13 respectively. Which pair of elements belong to the same group?

(a) A and B

(b) B and D

(c) A and C

(d) D and E

8. Where would you locate the element with electronic configuration 2,8 in the Modern Periodic Table?

(a) Group 8

(b) Group 2

(c) Group 18

(d) Group 10

9. An element which is an essential constituent of all organic compounds belongs to

(a) group 1

(b) group 14

(c) group 15

(d) group 16

10. Which of the following is the outermost shell for elements of period 2?

(a) K shell

(b) L shell

(c) M shell

(d) N shell

11. Which one of the following elements exhibit maximum number of valence electrons?

(a) Na (b) Al

(c) Si (d) P

12. Which of the following gives the correct increasing order of the atomic radii of O, F and N ?

(a) O, F, N (b) N, F, O

(c) O, N, F (d) F, O, N

13. Which among the following elements has the largest atomic radii?

(a) Na

(b) Mg

(c) K

(d) Ca

14. Which of the following elements would lose an electron easily?

(a) Mg

(b) Na

(c) K

(d) Ca

15. Which of the following elements does not lose an electron easily?

(a) Na (b) F

(c) Mg (d) Al

16. Which of the following are the characteristics of isotopes of an element?

(i) Isotopes of an element have same atomic masses

(ii) Isotopes of an element have same atomic number

(iii) Isotopes of an element show same physical properties

(iv) Isotopes of an element show same chemical properties

(a) (i), (iii) and (iv) (b) (ii), (iii) and (iv)

(c) (ii) and (iii) (d) (ii) and (iv)

17. Arrange the following elements in the order of their decreasing metallic character

Na, Si, Cl, Mg, Al

(a) Cl > Si >Al > Mg >Na

(b) Na >Mg >Al >Si > Cl

(c) Na > Al > Mg > Cl > Si

(d) Al > Na> Si > Ca> Mg

18. Arrange the following elements in the order of their increasing nonmetallic character

Li, O, C, Be, F

(a) F < O < C < Be < Li

(b) Li < Be < C < O< F

(c) F < O < C < Be < Li

(d) F < O < Be < C < Li

19. What type of oxide would Eka– aluminium form?

(a) EO_3 (b) E_3O_2

(c) E_2O_3 (d) EO

20. Three elements B, Si and Ge are

(a) metals (b) non-metals

(c) metalloids (d) metal, non-metal and metalloid respectively

21. Which of the following elements will form an acidic oxide?

(a) An element with atomic number 7

(b) An element with atomic number 3

(c) An element with atomic number 12

(d) An element with atomic number 19

22. The element with atomic number 14 is hard and forms acidic oxide and a covalent halide. To which of the following categories does the element belong?

(a) Metal (b) Metalloid

(c) Non-metal (d) Left-hand side element

23. Which one of the following does not increase while moving down the group of the periodic table?

(a) Atomic radius

(b) Metallic character

(c) Valence

(d) Number of shells in an element

24. On moving from left to right in a period in the periodic table, the size of the atom.

(a) increases (b) decreases

(c) does not change appreciably (d) first decreases and then increases

25. Which of the following set of elements is written in order of their increasing metallic character?

(a) Be Mg Ca

(b) Na Li K

(c) Mg Al Si

(d) C O N

26. The three elements A, B and C with similar properties have atomic masses X, Y and Z respectively. The mass of Y is approximately equal to the average mass of X and Z. What is such an arrangement of elements called as? Give one example of such a set of elements.

27. Elements have been arranged in the following sequence on the basis of their increasing atomic masses.

F, Na, Mg, Al, Si, P, S, Cl, Ar, K

(a) Pick two sets of elements which have similar properties.

(b) The given sequence represents which law of classification of elements?

28. Can the following groups of elements be classified as Dobereiner's triad ?

(a) Na, Si, Cl (b) Be, Mg, Ca

Atomic mass of Be 9; Na 23; Mg 24; Si 28; Cl 35; Ca 40

Explain by giving reason.

29. In Mendeleev 's Periodic Table the elements were arranged in the increasing order of their atomic masses. However, cobalt with atomic mass of 58.93 amu was placed before nickel having an atomic mass of 58.71 amu. Give reason for the same.

30. "Hydrogen occupies a unique position in Modern Periodic Table". Justify the statement.

31. Write the formulae of chlorides of Eka-silicon and Eka-aluminium, the elements predicted by Mendeleev.

32. Three elements A, B and C have 3, 4 and 2 electrons respectively in their outermost shell. Give the group number to which they belong in the Modern Periodic Table. Also, give their valencies.

33. If an element X is placed in group 14, what will be the formula and the nature of bonding of its chloride?

34. Compare the radii of two species X and Y. Give reasons for your answer.

(a) X has 12 protons and 12 electrons

(b) Y has 12 protons and 10 electrons

35. Arrange the following elements in increasing order of their atomic radii.

(a) Li, Be, F, N (b) Cl, At, Br I

36. Identify and name the metals out of the following elements whose electronic configurations are given below.

(a) 2, 8, 2 (b) 2, 8, 1

(c) 2, 8, 7 (d) 2, 1

37. Write the formula of the product formed when the element A (atomic number 19) combines with the element B (atomic number 17). Draw its electronic dot structure. What is the nature of the bond formed?

38. Arrange the following elements in the increasing order of their metallic character

Mg, Ca, K, Ge, Ga

39. Identify the elements with the following property and arrange them in increasing order of their reactivity

(a) An element which is a soft and reactive metal

(b) The metal which is an important constituent of limestone

(c) The metal which exists in liquid state at room temperature

40. Properties of the elements are given below. Where would you locate the following elements in the periodic table?

(a) A soft metal stored under kerosene

(b) An element with variable (more than one) valency stored under water.

(c) An element which is tetravalent and forms the basis of organic chemistry

(d) An element which is an inert gas with atomic number 2

(e) An element whose thin oxide layer is used to make other elements corrosion resistant by the process of " anodising"

41. An element is placed in 2nd Group and 3rd Period of the Periodic Table, burns in presence of oxygen to form a basic oxide.

(a) Identify the element

(b) Write the electronic configuration

(c) Write the balanced equation when it burns in the presence of air

(d) Write a balanced equation when this oxide is dissolved in water

(e) Draw the electron dot structure for the formation of this oxide

42. An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide.

(a) Where in the periodic table are elements X and Y placed?

(b) Classify X and Y as metal (s), non-metal (s) or metalloid (s)

(c) What will be the nature of oxide of element Y? Identify the nature of bonding in the compound formed

(d) Draw the electron dot structure of the divalent halide

43. Atomic number of a few elements are given below 10, 20, 7, 14

(a) Identify the elements

(b) Identify the Group number of these elements in the Periodic Table

(c) Identify the Periods of these elements in the Periodic Table

(d) What would be the electronic configuration for each of these elements?

(e) Determine the valency of these elements

44. In which form matter is present around us?

45. At present, how many elements are known to us?

46. The earliest attempt in classifying elements resulted in the formation of two groups of elements. What are they?

47. Who made the first attempt of classifying elements?

48. On what basis Dobereiner classified elements?

49. Dobereiner classified elements into how many groups?

50. What name was given to Dobereiner groups?

51. What is the total number of elements in Dobereiner groups?

52. How did John Newlands classify elements?

53. Name the first element of Newland's octaves.

54. Name the last element of Newland's octaves.

55. What is your observation from Newland's octaves?

56. What is Newland's Law of octaves?

57. Besides atomic masses, on what other basis were the elements arranged in the Mendleev's periodic table?

58. Which chemical property of an element was treated as one of the basic property for classifying elements and why?

59. What name is given to vertical columns in Mendleev's periodic table?

60. What name is given to horizontal rows in Mendleev's periodic table?

61. While developing the Periodic table, at few places Mendleev inverted the sequence of some elements i.e. he placed an element with slightly greater atomic mass before the element of lower atomic mass. Why did he do so?

62. Though the atomic mass of cobalt (58.9) is greater than nickel (58.7) yet Co is placed before Ni in Mendleev's periodic table. Why?

63. Which elements did not exist at the time of Mendleev's periodic classification? What name was given to these elements?

64. In what way hydrogen resembles alkali metals?

65. In what way hydrogen resembles halogens?

66. Why hydrogen cannot be given a fixed position in periodic table?

67. What is the first limitation of Mendleev's periodic table?

68. How isotopes of all the elements posed a challenge to Mendleev's periodic table?

69. Who proposed that atomic number is the more fundamental property for classifying elements?

70. In Modern periodic table, How do elements belonging to the same group resemble each other? Write two points.

71. Different elements have same number of shells, in group or in period?

72. First period of the Modern periodic table contains only two elements. Justify.

73. How many elements are present in second group of the periodic table? Justify.

74. "The valence electrons determine the kind and number of bonds formed by an element". Justify.

75. An element belongs to the first group and third period of the periodic table. What conclusion can you draw from its position ?

76. A metal M forms an oxide having the formula M2O3. It belongs to the third period and thirteenth group of the Modern periodic table. Write the atomic number and valency of the element.

77. What were the two major shortcomings of Mendleev's periodic table? How have these been removed in the modern periodic table?

78. Two elements X and Y have atomic numbers 12 and 16 respectively. Write the electronic configuration for these elements. To which period of the modern periodic table do these two elements belong? What type of bond will be formed between them and Why?

79. What were the two achievements of Mendleev's periodic table? What was the basis of classification of elements in it?

80. Atomic radius decreases in moving from left to right in a period. Why?

81. Atomic radius increases down the group. Why?

82. In the modern periodic table a zig-zag line separates metals from non-metals. What are these elements called and why?

83. X, Y and Z are the elements of a doberniers triad. If the atomic mass of X is 7and that of z is 39, what should be the atomic mass of Y?

84. A and B are the two elements having similar properties which obey Newlands law of octaves. How many elements are there in between A and B?

85. Why Na is greater in atomic size than Na^+ ?

86. Why does ionization energy generally decrease going down a group or family?

87. An element X (2,8,2) combines separately with NO_3^- and $(SO_4)^{2-}$, $(PO_4)^{3-}$ radicals. Write the formulae of the three compounds so formed. To which group of the periodic table does the element 'X' belong? Will it form covalent or ionic compound? Why?

88. A metal M forms an oxide having the formula M_2O_3. It belongs to 3rd period in the modern periodic table. Write the atomic number and valency of the metal.

89. Which of the two elements A=2,8,1 B = 2,8,8,1 i s more electropositive?

90. How does the atomic size vary in going from A) Left to right in a period B) Top to Bottom in a group

91. An element has atomic number 13. In which group and period it should be placed?

92. How many periods and groups are there in the long from of P.T?

93. Why does the size of the atoms progressively become smaller when we move from sodium (Na) to chlorine (Cl) in the third period of the period table ?

94. Give symbols for A. A metal of group 2. B. A metal of group 13. C. Two non metals of group 16. D. Most reactive non- metal of group 17.