



CHEMISTRY

BOOKS - NAVNEET PUBLICATION

PERIODIC CLASSIFICATION OF ELEMENTS

Solved

1. What are types of matter?



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2. What are the types of elements ?



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3. What are the smallest particles of matter called?



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4. What is the difference between the molecules of elements and compounds?

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5. What are the values of n for the shells K, L and M?

Can you -

Shell	n	$2n^2$	Electron capacity
K	1	2×1^2	2
L	2	2×2^2	8
M	3	2×3^2	18
N	4	2×4^2	32

the values of n for the shells

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6. What is the maximum number of electrons that can be accommodated in a shell? write the formula



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7. Deduce the maximum electron capacity of the shells K, L and M?



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Exercise

1. Fill in the blanks

Using Dobereiner's law of triads, find the missing no.



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2. Fill in the blanks

In the Mendeleev's periodic table, properties of elements are periodic function of their....



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3. Fill in the blanks

The vertical columns in the Mendeleev's periodic table are called....



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4. Fill in the blanks

Eka-aluminium is called.....



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5. Fill in the blanks

Zero group elements are called.....



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6. Fill in the blanks

In the modern periodic table, the elements are the periodic functions of....



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7. Fill in the blanks

The d-block elements are called...



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8. Fill in the blanks

The group contains the members of the halogen family.



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9. Fill in the blanks

..... is the distance between the nucleus of the atom and its outermost shell.



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10. Fill in the blanks

The number of electrons in an atom is equal to the same of.....



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11. Fill in the blanks

Henry Mosely showed that the atomic number (Z) of an element corresponds to the positive charge on the nucleus or the number of.....



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12. The _____ contains the group 1 and 2 elements



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13. Fill in the blanks

The elements arranged in such a way thatare on left side of zig- zag line andon the right side.



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14. Choose the correct alternative and write it along with its allotted alphabet :

The number of electrons in the outermost shell of alkali metals is.....

A. 1

B. 2

C. 3

D. 7

Answer:



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15. Alkali earth metals have valency 2. This means that their position in the Modern periodic table is in _____

A. Group 2

B. Group 16

C. Period 2

D. d-block

Answer:



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16. Molecular formula of the chloride of an element X is XCl . This compound is a solid having high melting point. Which of the following element be present in the same group as X.

A. Na

B. Mg

C. Al

D. Si

Answer:



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17. In which block of the modern periodic table are the non-metals present?

- A. s- block
- B. p-block
- C. d-block
- D. f-block

Answer:



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18. Choose the correct alternative and write it along with its allotted alphabet :

Which of the following triads does not follow Dobereiner's law of triads ?

A. Li,Na,K

B. Ca,Sr,Ba

C. Be,Mg,Ca

D. Cu,Ag,Au

Answer:



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19. Choose the correct alternative and write it along with its allotted alphabet :

During Newlands' time..... elements were known.

A. 56

B. 65

C. 63

D. 36

Answer:



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20. Choose the correct alternative and write it along with its allotted alphabet :

Halogens belong to group in the modern periodic table.

A. 15

B. 16

C. 17

D. 18

Answer:



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21. Choose the correct alternative and write it along with its allotted alphabet :

Noble gases belong to group in the modern periodic table.

A. 15

B. 16

C. 17

D. 18

Answer:



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22. Choose the correct alternative and write it along with its allotted alphabet :

The law of octaves was given by.....

A. Dobereiner

B. Newlands

C. Mendeleev

D. Moseley

Answer:



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23. Choose the correct alternative and write it along with its allotted alphabet :

Eka-boron was subsequently named as

A. gallium

B. germanium

C. scandium

D. molybdenum

Answer:



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24. Choose the correct alternative and write it along with its allotted alphabet :

The halogen which is liquid at room temperature is.....

A. fluorine

B. astatine

C. bromine

D. iodine

Answer:



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25. Choose the correct alternative and write it along with its allotted alphabet :

..... is used in balloons and in scuba diving .

A. Helium

B. Oxygen

C. Nitrogen

D. Ozone

Answer:



26. Choose the correct alternative and write it along with its allotted alphabet :

The number of electrons in the outermost shell of alkaline earth metal is.....

A. 1

B. 2

C. 3

D. 7

Answer:



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27. Fill in the blanks

In the Mendeleev's periodic table, properties of elements are periodic function of their....

A. atomic numbers

B. atomic masses

C. densities

D. boiling points

Answer:



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28. Choose the correct alternative and write it along with its allotted alphabet :

Lithium (Li),.....and potassium (k) is Dobereiner's triad.

A. magnesium (Mg)

B. aluminium (Al)

C. sodium (Na)

D. calcium (Ca)

Answer:



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29. State whether the following statements are True or False:

Newlands was the first to classify elements having similar chemical properties into groups of three.



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30. State whether the following statements are True or False:

Dobereiner named the group of elements having similar properties as Triads.



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31. State whether the following statements are True or False:

Dobereiner stated the law of octet.



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32. State whether the following statements are True or False:

Newlands stated the law of triads.



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33. State whether the following statements are True or False:

Eka- aluminium was later named as germanium.



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34. State whether the following statements are True or False:

Mendeleev's periodic table is more useful because it gives information about known and unknown elements.



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35. State whether the following statements are True or False:

Mendeleev arranged elements in the increasing order of their atomic masses.



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36. State whether the following statements are True or False:

Mendeleev was the first who successfully classified all known elements.



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37. State whether the following statements are

True or False:

In the modern periodic table, properties of the elements are a periodic function of their atomic numbers.



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38. State whether the following statement is

True or False :

The d-block elements are called transition elements



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39. State whether the following statements are True or False:

There are 7 periods in the long form of the periodic table.



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40. State whether the following statements are True or False:

Elements are classified on the basis of their atomic numbers.



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41. State whether the following statements are True or False:

The chemical properties of the elements in the same group show similarity.





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42. State whether the following statements are True or False:

Lanthanides and actinides are also called the d-block elements.



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43. State whether the following statements are True or False:

All the elements of a group have the same number of valence electrons.



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44. State whether the following statements are True or False:

In a period, atomic sizes increases from left to right.



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45. State whether the following statements are True or False:

In a period, the metallic character increases from left to right.



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46. State whether the following statements are True or False:

In a group, the metallic character decreases from top to bottom.





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47. State whether the following statements are True or False:

The zig-zag line separates the metals from nonmetals in the periodic table i.e. metals are on the left side and nonmetals are on the right side.



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48. Complete the analogy

Dobereiner:Triad::Newlands:_____



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49. Complete the analogy

Mendeleev's periodic Table: Atomic mass::

Modern periodic table:_____



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50. By observing the correlation in the first pair, complete the second pair:

Group 1 : Alkali metals : : : Halogens.



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51. By observing the correlation in the first pair, complete the second pair:

Solid: Iodine : :: Bromine.



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52. By observing the correlation in the first pair, complete the second pair:

Chlorine : 2,8,7 :: Fluorine :



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53. By observing the correlation in the first pair, complete the second pair:

Horizontal row : periods :: : Groups.



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54. Find the odd one out. Give proper explanation:

Newlands, Moseley, Dobereiner, Mendeleev.



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55. Find the odd one out. Give proper explanation:

Fluorine, Sulphur, Bromine, Iodine.



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56. Find the odd one out. Give proper explanation:

Sodium,Aluminium,Chlorine,Carbon.



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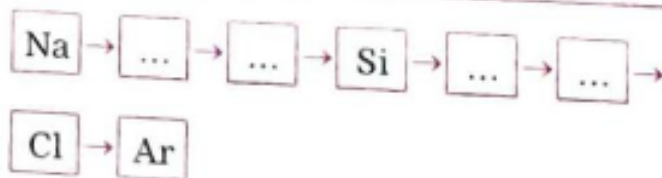
57. Find the odd one out. Give proper explanation:

Nitrogen,Neon,Argon,Helium.



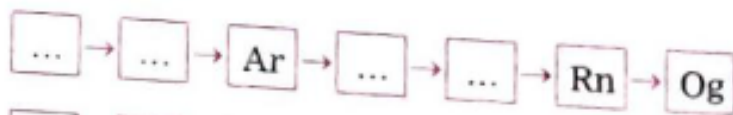
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58. Complete the flow chart



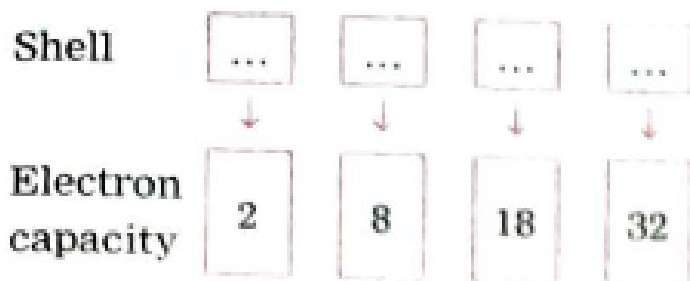
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59. Complete the flow chart



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60. Complete the flow chart



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61. Rearrange the columns 2 and 3 so as to match with the column 1:

Column 1	Column 2	Column 3
i. Triad	a. Lightest and negatively charged particle in all the atoms	1. Mendeleev
ii. Octave	b. Concentrated mass and positive charge	2. Thomson
iii. Atomic number	c. Average of the first and the third atomic mass	3. Newlands
iv. Period	d. Properties of the eighth element similar to the first	4. Rutherford
v. Nucleus	e. Positive charge on the nucleus	5. Dobereiner
vi. Electron	f. Sequential change in molecular formulae	6. Moseley



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62. Match the columns:

[1]	Column I	Column II
(1)	Modern periodic table	(a) Group 17
(2)	Vertical columns	(b) Period 2
		(c) Atomic number
		(d) Group



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63. Match the columns:

[2]	Column I	Column II
(1)	Dobereiner	(a) Atomic number
(2)	Newlands	(b) Triads
		(c) Atomic mass
		(d) Octaves



64. Match the columns:

[3]	Column I	Column II
(1)	Eka-silicon	(a) Scandium
(2)	Eka-boron	(b) Gallium
		(c) Germanium
		(d) Caesium



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65. Match the columns:

[4]	Column I	Column II
(1)	Noble gas	(a) 18 elements
(2)	First period	(b) Eight elements
		(c) Two elements
		(d) Helium



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66. Match the columns:

[5] Column I	Column II
(1) <i>s</i> -block elements	(a) Lanthanides and actinides
(2) <i>p</i> -block elements	(b) Groups 1, 2 (c) Groups IIIA to VIIA and zero group (d) Groups 13 to 18



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67. Match the columns:

[6] Column I	Column II
(1) Helium	(a) Alkali metal
(2) Horizontal row	(b) Alkaline earth metal
	(c) Period
	(d) Zero group



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68. Write the names from the description:

The period with electrons in the shells K,L and

M.



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69. Write the names from the description:

The group with valency zero.



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70. The family of non-metals having valency one .



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71. The family of metals having valency two



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72. The metalloids in the second and third periods



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73. The family of metals having valency one .



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74. Non-metals in the third period .



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75. Two elements having valency 4.



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76. Write the names from the description:

First three noble gases.



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77. Name the following:

Horizontal rows in modern periodic table.



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78. Name the following:

Two elements having a single electron in their outermost shell.



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79. Three elements with filled outermost shell



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80. Three elements having 7 electrons in their outermost shell



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81. Name the following:

An alkali metal in the period 2.





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82. Name the following:

An alkaline earth metal in the period 3.



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83. Name the following:

Halogen in the period 3. .



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84. Name the following:

Three nonmetallic elements in the period 2.



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85. Name the following:

The element with electronic configuration
(2,7).



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86. Name the following:

The elements in periods 2 and 3 having stable electronic configuration.



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87. Name the following:

The three metals in the third period of the modern periodic table.



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88. Name the following:

The names of blocks in modern periodic table.



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89. The atom having the smallest size.



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90. The atom having the smallest atomic mass

.





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91. The most electronegative atom



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92. The noble gas with the smallest atomic radius



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93. The most reactive nonmetal



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94. An element has its electron configuration as 2,8,2. Answer the following questions.

What is the atomic number of this element?



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95. An element has its electron configuration as 2,8,2. Answer the following questions.

What is the valency of this element ?



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96. An element has its electron configuration as 2,8,2. Answer the following questions.

What is the group of this element?



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97. An element has its electron configuration as 2,8,2. Answer the following questions.

To which period does this element belong ?



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98. An element has its electron configuration as 2,8,2. Answer the following questions.

With which of the following elements would this element resemble? (Atomic numbers are given in brackets) N(7), Be(4), Ar(18), Cl(17),



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99. An element has its electron configuration as 2,8,8,2. Now answer the following questions.

What is the atomic number of this element?



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100. An element has its electron configuration as 2,8,8,2. Now answer the following questions.

What is the group of this element ?



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101. An element has its electron configuration as 2,8,8,2. Now answer the following questions.

To which period does this element belong ?



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102. Answer the following questions:

State Dobereiner's law of triads giving one example.



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103. Answer the following questions:

Give suitable illustration of Dobereiner's law of triads.



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104. Answer the following questions:

Identify Dobereiner's triads from the following groups of elements having similar chemical properties:

Mg(24.3),Ca(40.1),Sr(87.6)

S(32.1),Se(79.0),Te(127.6)

Be(9.0), Mg(24.3), Ca(40.1).



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105. Answer the following questions:

In Dobereiner's triad containing Li,Na,K if atomic masses of lithium and potassium are 6.9 and 39.1, then what will be the atomic mass of sodium ?



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106. Answer the following questions:

State the limitations of Dobereiner's law of triads.



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107. Answer the following questions:

state Newlands' law of octaves..



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108. Answer the following questions:

Illustrate Newlands' law of octaves with a suitable example.



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109. Answer the following questions:

Explain the limitations of Newlands' law of octaves.



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110. Write a short note on:

Mendeleev's periodic law



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111. What is Mendeleev's Periodic law?



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112. State the merits of Mendeleev's periodic table.





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113. What are the demerits of Mendeleev's periodic table?



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114. Answer the following questions:

Write the molecular formulae of oxides of the following elements by referring to the Mendeleev's Periodic table. Na, Si, C Rb ,P ,Ba, Cl,Sn .



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115. Answer the following questions:

Write the molecular formulae of the compounds of the following elements with hydrogen by referring to the Mendeleev's Periodic table. C, S, Br, As, F, O, N, Cl.



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116. Answer the following questions:

Write a short note on : Moseley's contribution and the modern periodic table.



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117. Answer the following questions:

State the modern periodic law.



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118. Answer the following questions:

What is meant by modern periodic table ?



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119. Answer the following questions:

Describe the structure of the modern periodic table.



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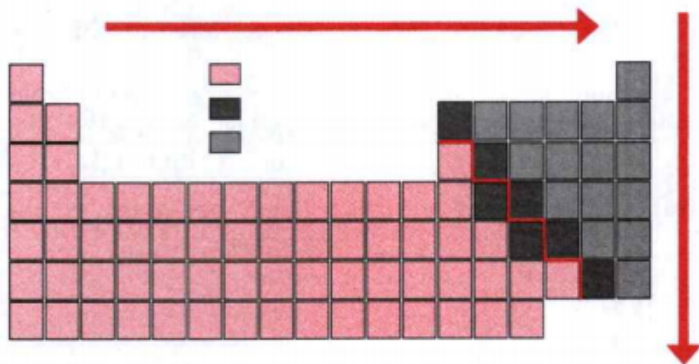
120. Answer the following questions:

Describe the structure of the modern periodic table.



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121. Write the answers of the question with reference to the structure of the periodic table.



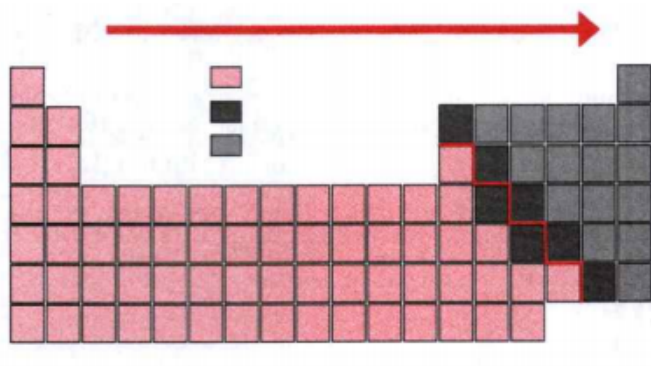
which

points are considered for the arrangement of the Modern period table?



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122. Write the answers of the question with reference to the structure of the periodic table.



How are

blocks indicated?



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123. Answer the following questions:

Write the answers of the questions with reference to the structural of the periodic

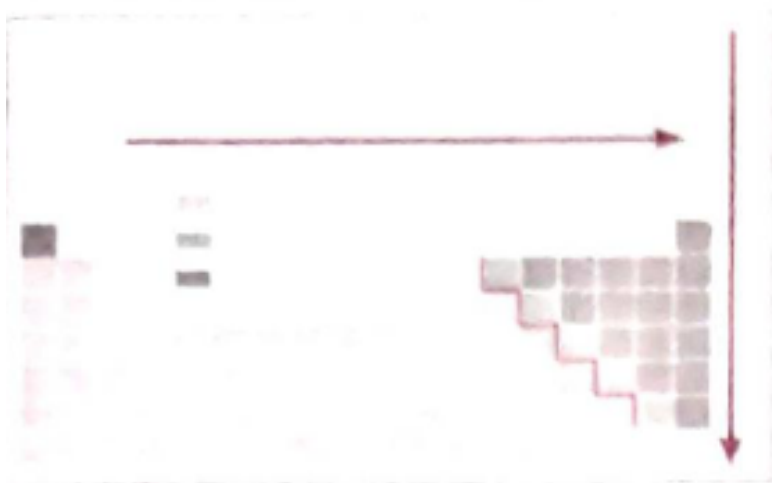


table.

Which elements are present near the zig-zag line?
line?



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124. Answer the following questions:

Write the answers of the questions with reference to the structural of the periodic

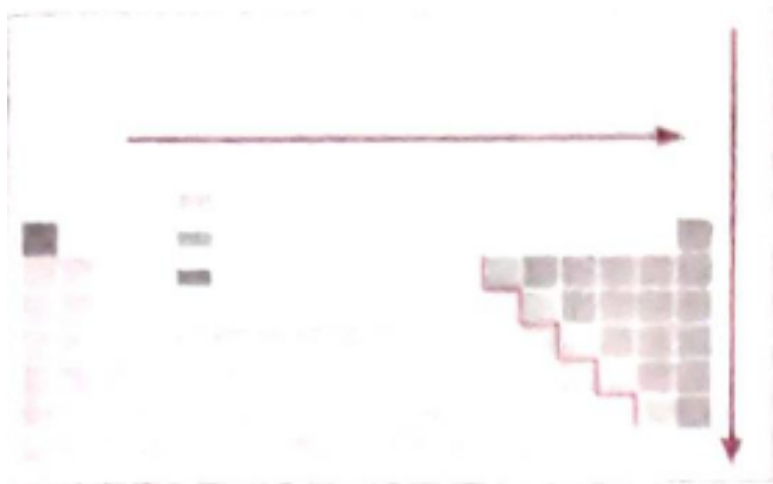


table.

Draw the electronic configuration of the

second row of elements of first group in the periodic table.



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125. Answer the following questions:

Write the answers of the questions with reference to the structural of the periodic

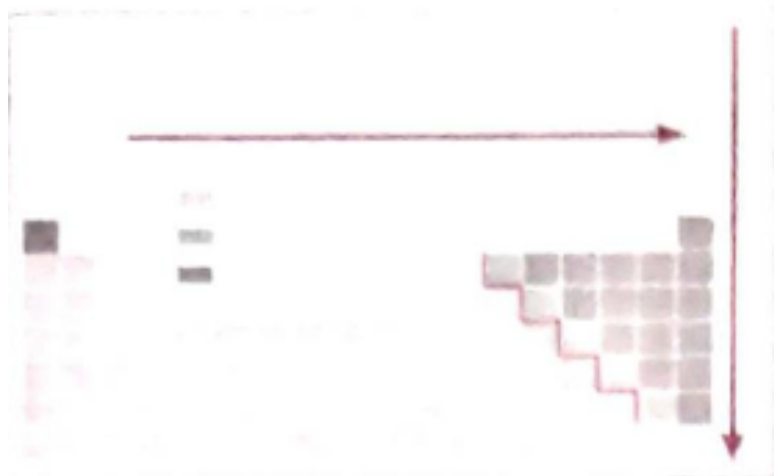


table.

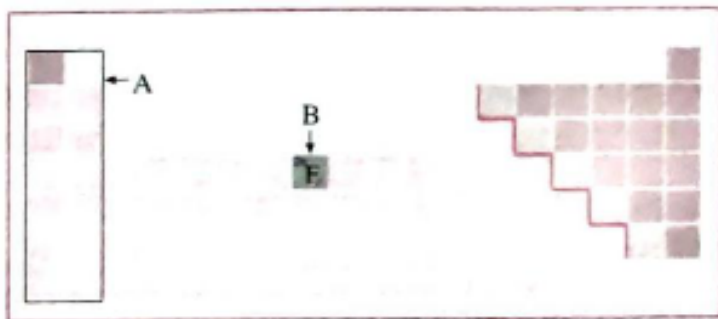
In a periodic table while going from left to right atomic radius decreases. Explain.



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126. Answer the following questions:

Observe the figure and answer the following questions.



Identify the block shown by box A and write an

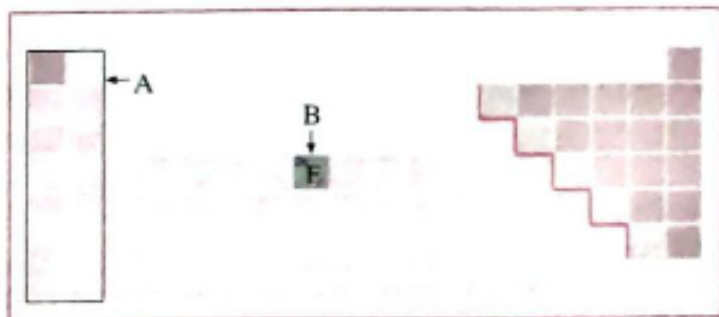
electronic configuration of any one element of this block.



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127. Answer the following questions:

Observe the figure and answer the following questions.



Identify the block of element denoted by letter B and write its period number.



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128. Answer the following questions:

Give two examples of metalloids.



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129. Write a short note on:

Position of isotopes in the Mendeleev's and the

Modern periodic table



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130. Answer the following questions:

Write a short note on the zig-zag line in the modern periodic table.



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131. Answer the following questions:

Classify the following elements into group 1,16

and 17:

Chlorine, Hydrogen, Oxygen, Bromine.



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132. Answer the following questions:

Classify the following elements into Alkali metals, Halogens, Alkaline earth metal:

(Cl- Br- I-),(Ca ,Sr,Mg), (Li,Na,K).



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133. Answer the following questions:

Classify the following elements into Metals, Nonmetals, Metalloids : (P,C,N),(Ca,Fe,Al), (Si,Ge,Sb),(K,Mg,Na).



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134. Answer the following questions:

Identify the electronic configuration of the inert gas elements, third row elements,seventeen group elements,second

group elements:

(2,8,2)

(2,8,8)

(2,8,1)

(2,7)

(2,2)

(2,8)

(2,8,7)



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135. Answer the following questions:

Define (i) Group (ii) Period.



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136. Answer the following questions:

Write the numbers of vertical columns (groups) and horizontal rows (periods) in the long form of the periodic table.



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137. Answer the following questions:

How many elements are there in the second and the third periods of the periodic table ?



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138. Answer the following questions:

State the number of elements in the shortest period..



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139. Answer the following questions:

State the number of elements in the modern periodic table..



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140. Answer the following questions:

Which column is known as the zero group in the modern periodic table ?



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141. Answer the following questions:

Which group elements have seven electrons in the outermost shell?



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142. Answer the following questions:

How many electrons are there in the outermost shell of group 2 elements?



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143. Answer the following questions:

How many electrons are there in the outermost shell of group 18 elements?



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144. Answer the following questions:

Which block of the modern periodic table separates metals and nonmetals with the help of zig-zag line?



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145. Answer the following questions:

Name the group to which the most reactive metals belong.



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146. Answer the following questions:

Name the element having one shell and one valence electron.



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147. Answer the following questions:

How many valence electrons are there in the outermost shell of silicon?



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148. Answer the following questions:

State the electronic configuration of nitrogen and phosphorus.



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149. Answer the following questions:

Write the electronic configuration :Al(13)



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150. Answer the following questions:

Name the group containing highly reactive nonmetal only.



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151. Answer the following questions:

Depending on electronic configuration the properties of the elements vary in different groups . Explain why ?



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152. Go through the Modern periodic table (fig2.1) and write the names one below the other of the elements of group 1.



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153. Answer the following questions:

Depending on electronic configuration the properties of elements vary in different periods. Explain why?



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154. On going through the Modern periodic table (fig2.1) it is seen that the elements Li, Be, B, C, N, O, F and Ne belong to the period -2. Write down the electronic configuration.



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155. Answer the following questions:

The elements in the third period , namely, Na, Mg,Al,Si,P,S,Cl and Ar have electrons in the three shells, K,L,M . Write down the electronic configuration of these elements.



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156. Answer the following questions:

What is meant by periodic trends in the modern periodic table?



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157. Answer the following questions:

What is meant by valency?



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158. Answer the following questions:

Define atomic size . How does it vary in a period and a group?



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159. Answer the following questions:

Discuss the trends in the variation of metallic and nonmetallic properties in a period and in a group.



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160. Answer the following questions:

Name the elements, group , formulae and physical state belonging to the halogen family.



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161. Answer the following questions:

There are some vacant places in the Mendeleev's periodic table. In some of these places the atomic masses are seen to be predicted. Enlist three of these predicted

atomic masses along with their group and period.



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162. Answer the following questions:

Due to uncertainty in the names of some of the elements, a question mark is indicated before the symbol in the Mendeleev's period table. What are such symbols?



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163. Chlorine has two isotopes, viz. Cl-35 and Cl-37. Their atomic masses are 35 and 37. Their chemical properties are same. Where should these be placed in Mendeleev's periodic table? In different places or in the same place?



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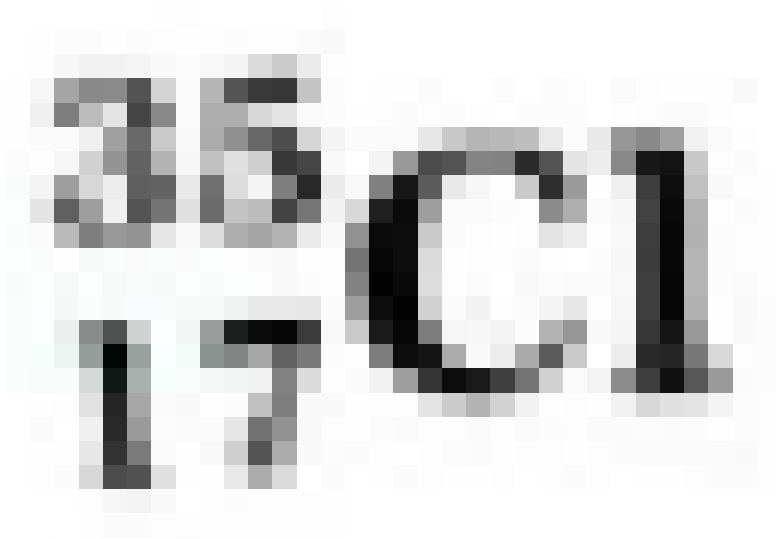
164. How is the problem regarding the position of cobalt ("₅₉Co) and nickel ("₅₈Ni) in Mendeleev's periodic table resolved in Modern periodic table ?



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165. Answer the following questions:

How did the position of



get fixed

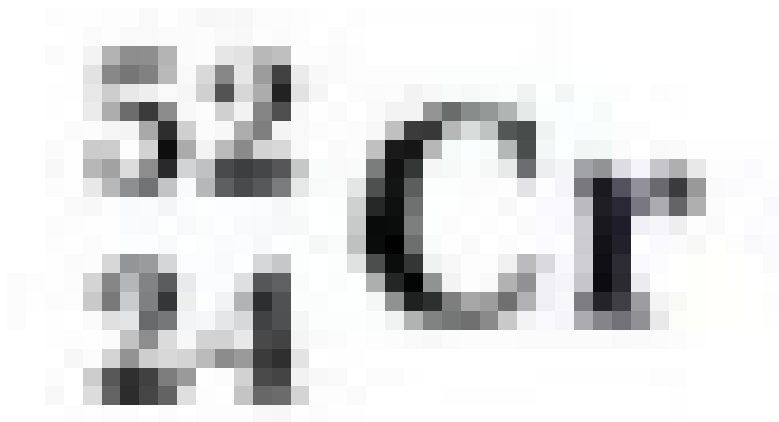
the modern periodic table?



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166. Answer the following questions:

Can there be an element with atomic mass 53 or 54 in between the two elements chromium



and

magnese

55

25

Mn?

?



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167. Answer the following questions:

What do you think? Should hydrogen be placed in the group 17 of halogens or group 1 of alkali metals in the modern periodic table?



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168. Answer the following questions:

The elements in the second period :Li, Be, B,C,N,O,F and Ne have electrons in the two shells K and L . Write down the electronic configuration of these elements.



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169. Answer the following questions:

The elements in the third period , namely, Na,

Mg,Al,Si,P,S,Cl and Ar have electrons in the three shells, K,L,M . Write down the electronic configuration of these elements.



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170. What is the relationship between the electronic configuration of an element and its valency?



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171. The atomic number of beryllium is 4 while that of oxygen is 8. Write down the electronic configuration of the two and deduce their valency from the same.



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172. What is the periodic trend in the variation of valency while going from left to right within a period. Explain the answer with reference to period 2 and period 3.





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173. Answer the following questions:

Considering the elements of period 3 in the modern periodic table, answer the following questions :

Name the 'element' in which all the shells are completely filled with electrons.



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174. Answer the following questions:

Considering the elements of period 3 in the modern periodic table, answer the following questions :

Name the element which has one electron in the outermost shell.



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175. Answer the following questions:

Considering the elements of period 3 in the

modern periodic table, answer the following questions :

State the most electronegative element in this period.



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176. Answer the following questions:

What is the periodic trend in the variation of valency while going down a group? Explain your answer with reference to the group 1, group 2 and group 18.



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177. Classify the elements of the third period into metals and non-metals.



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178. Answer the following questions:

On which side of the period are the metals?

Left or right ?



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179. On which side of the period did you find the Non-metals?



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180. What is the cause of non-metallic character of element?



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181. What is the expected trend in the variation of non-metallic character of element from left to right in a period?



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182. What would be the expected trend in the variation of non-metallic character of elements down a group?



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183. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.

${}_{3}\text{Li}$, ${}_{14}\text{Si}$, ${}_{2}\text{He}$, ${}_{11}\text{Na}$, ${}_{15}\text{P}$, Which

of these elements belong to the period 3?



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184. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.

${}^1\text{H}$, ${}^7\text{N}$, ${}^{20}\text{Ca}$, ${}^{16}\text{S}$, ${}^4\text{Be}$, ${}^{18}\text{Ar}$.

Which

of these elements belong to the second group

?



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185. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.

${}_{7}\text{N}$, ${}_{6}\text{C}$, ${}_{8}\text{O}$, ${}_{5}\text{B}$, ${}_{13}\text{Al}$. Which is the most electronegative element among these?



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186. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.



Which is

the most electropositive element among these

?



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187. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.

$_{11}\text{Na}$, $_{16}\text{P}$, $_{17}\text{Cl}$, $_{14}\text{Si}$, $_{12}\text{Mg}$, $_{9}\text{F}$

Which

of these has largest atoms ?



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188. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.



Which

of these atoms has smallest atomic radius ?



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189. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.

$_{13}\text{Al}$, $_{14}\text{Si}$, $_{11}\text{Na}$, $_{12}\text{Mg}$, $_{16}\text{S}$.

Which

of the above elements has the highest metallic character ?



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190. Answer the following questions:

Write down the electronic configuration of the following elements from the given atomic numbers. Answer the following question with explanation.



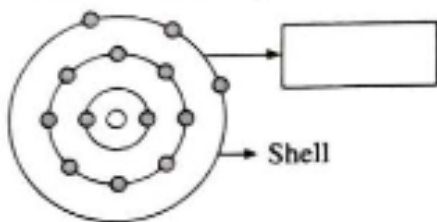
Which of the above elements has the highest nonmetallic character?



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191. Answer the following questions:

The atomic number of aluminium is 13, with the help of diagram , write the electronic configuration and valency.



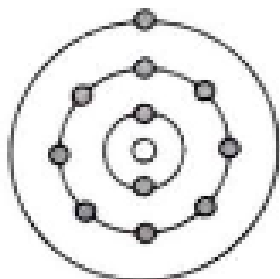
∴ The valency of aluminium =



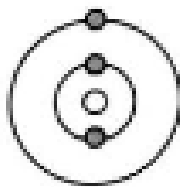
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192. Answer the following questions:

Observe the following diagram and answer the following questions:



X



Y

Do these elements belong to the same group?

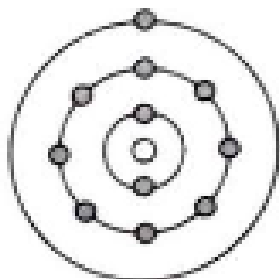
Explain.



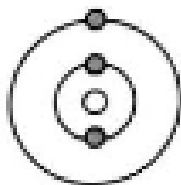
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193. Answer the following questions:

Observe the following diagram and answer the following questions:



X



Y

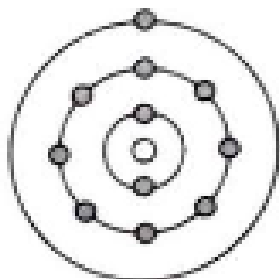
Which element is more electropositive in nature? why?



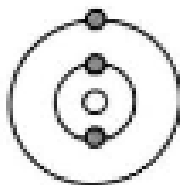
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194. Answer the following questions:

Observe the following diagram and write the answer the following questions:



X



Y

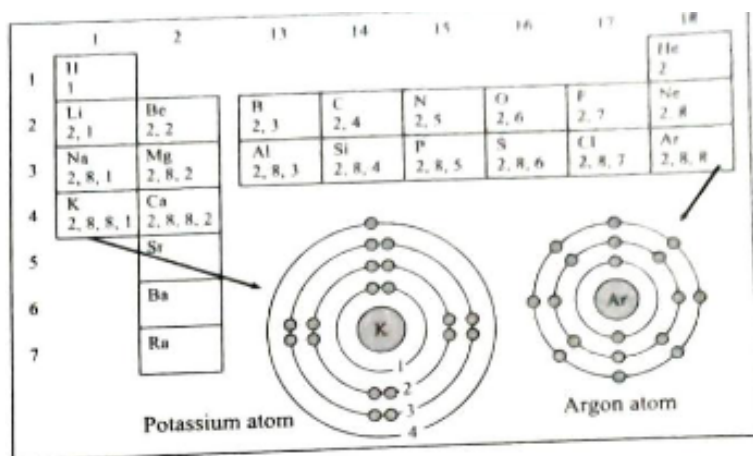
Write the atomic numbers of first two elements in the second group.



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195. Answer the following questions:

Observe the following diagram and write the answer the following questions:



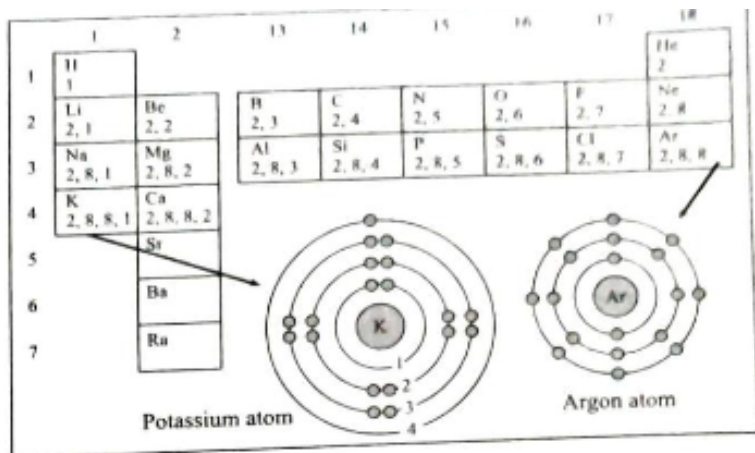
Write the number of valence electrons of the elements in the halogen group.



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196. Answer the following questions:

Observe the following diagram and write the answer the following questions:



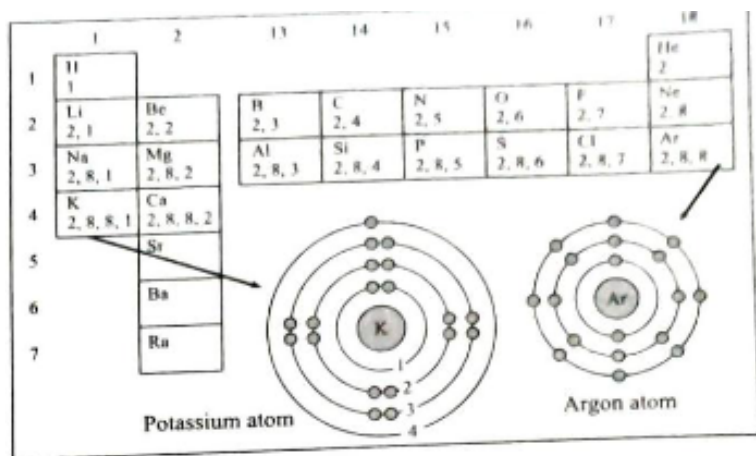
Draw the diagram of electronic configuration of magnesium atom.



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197. Answer the following questions:

Observe the following diagram and write the answer the following questions:



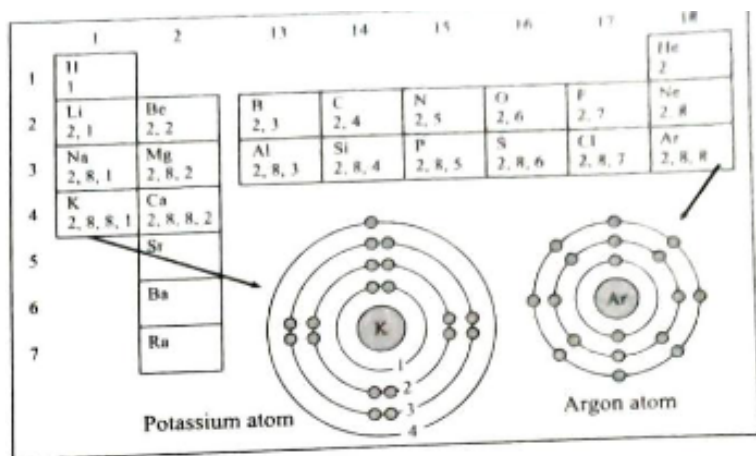
After completion of a period , what change does take place in the electronic configuration of the next element?



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198. Answer the following questions:

Observe the following diagram and write the answer the following questions:



Write the names of any two elements from the diagram which do not take part in chemical reaction.



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199. Atomic radius goes on decreasing while going from left to right in a period



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200. Give scientific reasons :

Metallic character goes on decreasing while going from left to right in a period



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201. Give scientific reasons :

Atomic radius goes on increasing down a group



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202. Give scientific reasons :

Elements belonging to the same group have the same valency



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203. Give scientific reasons :

Inert gases (zero group elements) are called noble gases.



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204. Give scientific reasons

While going down the second group , the reactivity of the alkaline earth metals increases.



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205. Give scientific reasons :

The third period contains only eight elements even though the electron capacity of the third shell is 18.



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206. Give scientific reasons :

Fluorine is the most reactive in Group 17.



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207. Sodium is more metallic than Aluminium .



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208. Distinguish between:

Mendeleev's periodic table and Modern periodic table



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