13^{TH} AND 14^{TH} GROUP ELEMENTS

Single Correct Answer Type:

1. Correct order of atomic radius of 13^{th} group elements is _____

   (A) $B < Al < Ga < In < Tl$ (B) $B > Al > Ga > In > Tl$

   (C) $B < Ga < Al < In < Tl$ (D) $B < Ga < Al < TI < In$

2. Correct order of atomic radius of 14^{th} group elements is _____

   (A) $C < Si < Ge < Sn < Pb$ (B) $C > Si > Ge > Sn > Pb$

   (C) $C < Si < Ge < Pb < Sn$ (D) $C < Ge < Si < Pb < Sn$

3. Correct order of IE_1 of 13^{th} group elements is _____

   (A) $B > Al > Ga > In > Tl$ (B) $B > Ga > Al > In > Tl$

   (C) $B > Ga > Al > Tl > In$ (D) $B > Tl > Ga > Al > In$

4. Correct order of IE_1 of 14^{th} group elements is _____

   (A) $C > Si > Ge > Sn > Pb$ (B) $C > Si > Ge > Pb > Sn$

   (C) $C > Ge > Si > Sn > Pb$ (D) $C > Ge > Si > Pb > Sn$

5. The element with lowest MP among Al, Ga, In and Tl is _____

   (A) Al (B) Ga (C) In (D) Tl

6. The element with lowest MP among Si, Ge, Sn and Pb is _____

   (A) Si (B) Ge (C) Sn (D) Pb

7. The correct order of EN of 13^{th} group elements is _____

   (A) $B > Al > Ga > In > Tl$ (B) $B > Ga > Al > In > Tl$

   (C) $B > Ga > Al > Tl > In$ (D) $B > Tl > In > Ga > Al$

8. The correct order of EN of 14^{th} group elements is _____

   (A) $C > Si > Ge > Sn > Pb$ (B) $C > Ge > Si > Pb > Sn$

   (C) $C > Pb > Sn > Ge > Si$ (D) $C > Pb > Sn \simeq Ge \simeq Si$

9. Correct number of hydrated water molecules present in borax $(Na_2B_4O_7.10H_2O)$ is

   (A) 10 (B) 8 (C) 6 (D) 4

10. Basicity of orthoboric acid is _____, when it acts as Lewis acid

    (A) 1 (B) 2 (C) 3 (D) 4

11. Maximum number of atoms that lie in one plane in case of Diborane is _____

    (A) 8 (B) 6 (C) 4 (D) 2

12. The hybridisation states of 'c' in diamond, graphite and fullerene are _____ , _____ and _____ respectively

    (A) sp^3, sp^2, sp^2 (B) sp^2, sp^2, sp^2 (C) sp^3, sp^2, sp (D) sp^3, sp, sp

13. The number of 5-membered rings and 6-membered rings in C_{60} is _____ and _____ respectively

    (A) 12, 20 (B) 20, 12 (C) 12, 12 (D) 20, 20

14. Synthesis gas is a mixture of _____

    (A) H_2O and CO (B) CO and H_2 (C) CO and N_2 (D) CO and CO_2

15. In SiO_2, silicon atom is covalently bonded to _____ oxygen atoms

(A) 2 (B) 4 (C) 6 (D) 8

16. Which of the following on hydrolysis followed by condensation polymerisation yields straight chain polymer of silicone

(A) CH_3SiCl_3 (B) $(CH_3)_2SiCl_2$ (C) $(CH_3)_3SiCl$ (D) $(CH_3)_4Si$

17. Which of the following property of silicone is incorrect?

(A) Silicones are water repellent (B) Silicones are thermally stable

(C) Silicones are biodegradable (D) Highly reactive towards chemical

18. Identify the incorrect statement regarding zeolites

(A) Zeolite is a aluminosilicate with cations such as Na^+, K^+ or Ca^{2+}

(B) These are used as a catalyst for cracking of hydrocarbons

(C) ZSM-5 (a type of zeolite) converts alcohol directly into gasoline

(D) Hydrated zeolites are used as anion exchangers in softening of hard water

19. Identify the incorrect option

(A) Basic structural unit of silicate is SiO_4^{4-}

(B) When silicate units are linked together by sharing 1, 2, 3, or 4 oxygen atoms per silicate units, they form chain, ring, sheet or three-dimentional structures

(C) Feldspar, zeolite, mica and asbestos are the examples of silicates

(D) Glass, cement and plastic are the man-made silicates

20. Identify the incorrect statement

(A) CO is highly poisonous gas

(B) $H_2CO_3/HCO_3^{\ominus}$ buffer system helps to maintain pH of blood between 7.26 to 7.42

(C) CO_2 is a poisonous gas

(D) CO_2 is a green house gas

Numerical Based:

21. A solid element (symbol – Y) conducts electricity and forms two chlorides

(i) YCl_n (a colourless volatile liquid)

(ii) YCl_{n-2} (a colourless solid)

To which group of the periodic table does Y belongs?

22. Number of moles of methane obtained on hydrolysis of one mole of aluminium carbide is _____

23. The number of tetrahedral boron atoms present in the structure of borax is _____

24. Maximum number of isomers of disubstituted borazine is _____

25. The number of π - bonds in borazine is _____

KEY

1.	C	2.	A	3.	D	4.	B	5.	B
6.	C	7.	D	8.	D	9.	B	10.	A
11.	B	12.	A	13.	A	14.	B	15.	B
16.	B	17.	D	18.	D	19.	D	20.	C
21.	14	22.	3	23.	2	24.	4	25.	3