

**CHEMISTRY**  
**The p-Block Elements**  
**(Part – B)**

1. Among Group 16 elements, which one does **NOT** show –2 oxidation state? (2024)

- (a) Se (b) Te  
 (c) Po (d) O

2. Given below are two statements:

**Statement I:** The boiling point of hydrides of group 16 elements follow the order  $H_2O > H_2Te > H_2Se > H_2S$ .

**Statement II:** On the basis of molecular mass  $H_2O$  is expected to have boiling point than the other members of the group but due to the presence of extensive H-bonding in  $H_2O$  it has higher boiling point.

In the light of the above statements, chose the *correct* answer the option given below: (2024)

- (a) Both Statement I and Statement II are false  
 (b) Statements I is true but statement II is false.  
 (c) Statement I is false but statement II is true.  
 (d) Both Statement I and statement II are true

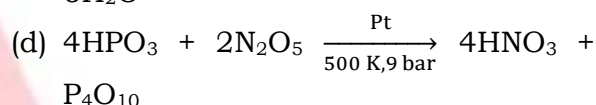
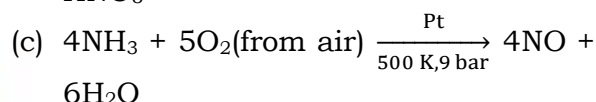
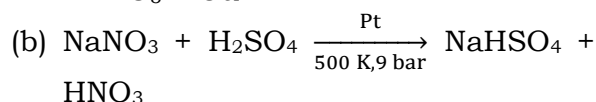
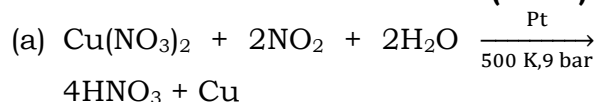
3. Match List I with List II: (2023)

List I (Oxoacids of sulphur)		List II (Bonds)	
A.	Peroxodisulphuric acid	1.	Two S-OH, Four S=O, One S-O-S
B.	Sulphuric acid	2.	Two S-OH, One S=O
C.	Pyrosulphuric acid	3.	Two S-OH, Four S=O, One S-O-O-S
D.	Sulphurous acid	4.	Two S-OH, Two S=O

Choose the correct answer from the options given below:

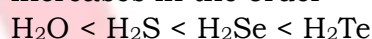
- (a) A-3, B-4, C-1, D-2  
 (b) A-1, B-3, C-4, D-2  
 (c) A-3, B-4, C-2, D-1  
 (d) A-1, B-3, C-2, D-4

4. Which of the following reactions is part of the large-scale industrial preparation of nitric acid? (2022)



5. Given below are two statements

**Statement I:** The boiling points of the following hydrides of group 16 elements increases in the order-



**Statement II:** The boiling points of these hydrides increase with increase in molar mass.

In the light of the above statements, choose the most appropriate answer from the options given below: (2022)

- (a) Both Statement I and Statement II are correct.  
 (b) Both Statement I and Statement II are incorrect.  
 (c) Statement I is correct but Statement II is incorrect.  
 (d) Statement I is incorrect but Statement II is correct.

6. Noble gases are named because of their inertness towards reactivity. Identify an **incorrect** statement about them. (2021)

- (a) Noble gases have very high melting and boiling points  
 (b) Noble gases have weak dispersion forces  
 (c) Noble gases have large positive values of electron gain enthalpy  
 (d) Noble gases are sparingly soluble in water

7. **Statement-I** : Acid strength increases in the order given as  $\text{HF} \ll \text{HCl} \ll \text{HBr} \ll \text{HI}$ .

**Statement-II** : As the size of the elements F, Cl, Br, I increases down the group, the bond strength of HF, HCl, HBr and HI decreases and so the acid strength increases.

In the light of the above statements, choose the correct answer from the options given below. **(2021)**

- (a) Both statement I and statement II are false  
 (b) Statement I is correct but statement II is false  
 (c) Statement I is incorrect but statement II is true  
 (d) Both statement I and statement II are true

8. In which one of the following arrangements the given sequence is **not** strictly according to the properties indicated against it? **(2021)**

- (a)  $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$  : Increasing  $\text{pK}_a$  values  
 (b)  $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3 < \text{SbH}_3$  : Increasing acidic character  
 (c)  $\text{CO}_2 < \text{SiO}_2 < \text{SnO}_2 < \text{PbO}_2$  : Increasing oxidizing power  
 (d)  $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$  : Increasing acidic strength

9. Urea reacts with water to form A which will decompose to form B. B when passed through  $\text{Cu}^{2+}$  (aq), deep blue colour solution C is formed. What is the formula of C from the following? **(2020)**

- (a)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$  (b)  $\text{Cu}(\text{OH})_2$   
 (c)  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$  (d)  $\text{CuSO}_4$

10. Which of the following oxoacid of sulphur has - O - O - linkage? **(2020)**

- (a)  $\text{H}_2\text{SO}_4$ , sulphuric acid  
 (b)  $\text{H}_2\text{S}_2\text{O}_8$ , peroxodisulphuric acid  
 (c)  $\text{H}_2\text{S}_2\text{O}_7$ , pyrosulphuric acid  
 (d)  $\text{H}_2\text{SO}_3$ , sulphurous acid

11. The reaction of concentrated sulphuric acid with carbohydrates ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ) is an example of **(2020 Covid Re-NEET)**

- (a) Oxidation (b) Reduction  
 (c) Sulphonation (d) Dehydration

12. Which one of the following reactions does not come under hydrolysis type reaction?

**(2020 Covid Re-NEET)**

- (a)  $\text{Li}_3\text{N}(s) + 3\text{H}_2\text{O}(l) \rightarrow \text{NH}_3(s) + 3\text{LiOH}(aq)$   
 (b)  $2\text{F}_2(g) + 2\text{H}_2\text{O}(l) \rightarrow 4\text{HF}(aq) + \text{O}_2(g)$   
 (c)  $\text{P}_4\text{P}_{10}(s) + 6\text{H}_2\text{O}(l) \rightarrow 4\text{H}_3\text{PO}_4(aq)$   
 (d)  $\text{SiCl}_4(l) + 2\text{H}_2\text{O}(l) \rightarrow \text{SiO}_2(s) + 4\text{HCl}(aq)$

13. Among the compounds shown below which one revealed a linear structure?

**(2020 Covid Re-NEET)**

- (a) HOCl (b)  $\text{O}_3$   
 (c)  $\text{N}_2\text{O}$  (d)  $\text{NO}_2$

14. Match the compounds of Xe in column I with the molecular structure in column II. **(2020 Covid Re-NEET)**

Column I		Column II	
A.	$\text{XeF}_2$	(i)	Square planar
B.	$\text{XeF}_4$	(ii)	Linear
C.	$\text{XeO}_3$	(iii)	Square pyramidal
D.	$\text{XeOF}_4$	(iv)	Pyramidal

- (a) A-(ii), B-(i), C-(iv), D-(iii)  
 (b) A-(ii), B-(i), C-(iii), D-(iv)  
 (c) A-(ii), B-(iv), C-(iii), D-(i)  
 (d) A-(ii), B-(iii), C-(i), D-(iv)

15. Match the Xenon compounds in Column-I with its structure in Column-II and assign the correct code: **(2019)**

Column I		Column II	
A.	$\text{XeF}_4$	(i)	Pyramidal
B.	$\text{XeF}_6$	(ii)	Square planar
C.	$\text{XeOF}_4$	(iii)	Distorted octahedral
D.	$\text{XeO}_3$	(iv)	Square pyramidal

**Code :**

- |     |       |       |       |      |
|-----|-------|-------|-------|------|
|     | A     | B     | C     | D    |
| (a) | (i)   | (ii)  | (iii) | (iv) |
| (b) | (ii)  | (iii) | (iv)  | (i)  |
| (c) | (ii)  | (iii) | (i)   | (iv) |
| (d) | (iii) | (iv)  | (i)   | (ii) |

16. Which is the correct thermal stability order for  $H_2E$  ( $E = O, S, Se, Te$  and  $Po$ )? (2019)

- (a)  $H_2S < H_2O < H_2Se < H_2Te < H_2Po$   
 (b)  $H_2O < H_2S < H_2Se < H_2Te < H_2Po$   
 (c)  $H_2Po < H_2Te < H_2Se < H_2S < H_2O$   
 (d)  $H_2Se < H_2Te < H_2Po < H_2O < H_2S$

17. Match the following: (2019)

Column I		Column II	
A.	Pure nitrogen	(i)	Chlorine
B.	Haber process	(ii)	Sulphuric acid
C.	Contact process	(iii)	Ammonia
D.	Deacon's process	(iv)	Sodium azide or Barium azide

Which of the following is the correct option?

- |     |       |       |       |       |
|-----|-------|-------|-------|-------|
|     | A     | B     | C     | D     |
| (a) | (i)   | (ii)  | (iii) | (iv)  |
| (b) | (ii)  | (iv)  | (i)   | (iii) |
| (c) | (iii) | (iv)  | (ii)  | (i)   |
| (d) | (iv)  | (iii) | (ii)  | (i)   |

18. The correct order of N-compounds in its decreasing order of oxidation states is (2018)

- (a)  $HNO_3, NO, N_2, NH_4Cl$   
 (b)  $HNO_3, NO, NH_4Cl, N_2$   
 (c)  $NH_4Cl, N_2, NO, HNO_3$   
 (d)  $HNO_3, NH_4Cl, NO, N_2$

19. Which of the following statements is not true for halogens? (2018)

- (a) All form monobasic oxyacids  
 (b) All are oxidizing agents  
 (c) Chlorine has the highest electron-gain enthalpy  
 (d) All but fluorine show positive oxidation states

20. In the structure of  $ClF_3$ , the number of lone pair of electrons on central atom 'Cl' is (2018)

- (a) One  
 (b) Two  
 (c) Three  
 (d) Four

21. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity? (2018)

- (a)  $N_2O_5$   
 (b)  $NO_2$   
 (c)  $NO$   
 (d)  $N_2O$

22. Which of the following pairs of compounds is isoelectronic and isostructural? (2017-Delhi)

- (a)  $IF_3, XeF_2$   
 (b)  $BeCl_2, XeF_2$   
 (c)  $TeI_2, XeF_2$   
 (d)  $IBr_2^-, XeF_2$

23. Match the interhalogen compounds of column I with the geometry in column II and assign the correct code: (2017-Delhi)

Column I		Column II	
A.	$XX'$	(i)	T-shape
B.	$XX'_3$	(ii)	Pentagonal bipyramidal
C.	$XX'_5$	(iii)	Linear
D.	$XX'_7$	(iv)	Square-pyramidal
		(v)	Tetrahedral

Code:

- |     |       |       |       |      |
|-----|-------|-------|-------|------|
|     | A     | B     | C     | D    |
| (a) | (iv)  | (iii) | (ii)  | (i)  |
| (b) | (iii) | (iv)  | (i)   | (ii) |
| (c) | (iii) | (i)   | (iv)  | (ii) |
| (d) | (v)   | (iv)  | (iii) | (ii) |

24. In which pair of ions both the species contain S-S bond? (2017-Delhi)

- (a)  $S_4O_6^{2-}, S_2O_7^{2-}$   
 (b)  $S_2O_7^{2-}, S_2O_3^{2-}$   
 (c)  $S_4O_6^{2-}, S_2O_3^{2-}$   
 (d)  $S_2O_7^{2-}, S_2O_8^{2-}$

25. Which of the following absorbs carbon dioxide and releases oxygen? (2017-Gujarat)

- (a)  $K_2O$   
 (b)  $CaO$   
 (c)  $KO_2$   
 (d)  $KOH$

26. Which of the following pairs shows highest bond dissociation enthalpy among halogens and lowest bond dissociation enthalpy among hydrogen halides? **(2017-Gujarat)**  
 (a) I<sub>2</sub>, HI (b) F<sub>2</sub>, HF  
 (c) Cl<sub>2</sub>, HF (d) Br<sub>2</sub>, HBr
27. Strong reducing behaviour of H<sub>3</sub>PO<sub>2</sub> is due to : **(2017-Gujarat)**  
 (a) Low coordination number of P  
 (b) Low oxidation state of P  
 (c) Presence of one - OH group and two P - H bonds  
 (d) Presence of two - OH groups and one P - H bond
28. Among halogens, the one which can oxidise water to oxygen is : **(2017-Gujarat)**  
 (a) Iodine (b) Chlorine  
 (c) Bromine (d) Fluorine
29. The correct geometry and hybridization for XeF<sub>4</sub> are : **(2016-II)**  
 (a) Planar triangle, sp<sup>3</sup>d<sup>3</sup>  
 (b) Square planar, sp<sup>3</sup>d<sup>2</sup>  
 (c) Octahedral, sp<sup>3</sup>d<sup>2</sup>  
 (d) Trigonal bipyramidal, sp<sup>3</sup>d
30. Match the compound given in column I with the hybridization and shape given in column II and mark the correct option. **(2016-I)**

	Column I		Column II
A.	XeF <sub>6</sub>	(i)	Distorted octahedral
B.	XeO <sub>3</sub>	(ii)	Square planar
C.	XeOF <sub>4</sub>	(iii)	Pyramidal
D.	XeF <sub>4</sub>	(iv)	Square pyramidal

**Code:**

- |  |   |   |   |   |
|--|---|---|---|---|
|  | A | B | C | D |
|--|---|---|---|---|
- (a) (iv) (i) (ii) (iii)  
 (b) (i) (iii) (iv) (ii)  
 (c) (i) (ii) (iv) (iii)  
 (d) (iv) (iii) (i) (ii)
31. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules? **(2016-I)**  
 (a) F<sub>2</sub> > Cl<sub>2</sub> > Br<sub>2</sub> > I<sub>2</sub>  
 (b) I<sub>2</sub> > Br<sub>2</sub> > Cl<sub>2</sub> > F<sub>2</sub>  
 (c) Cl<sub>2</sub> > Br<sub>2</sub> > F<sub>2</sub> > I<sub>2</sub>  
 (d) Br<sub>2</sub> > I<sub>2</sub> > F<sub>2</sub> > Cl<sub>2</sub>
32. Among the following, the correct order of acidity is: **(2016-I)**  
 (a) HClO<sub>4</sub> < HClO<sub>2</sub> < HClO < HClO<sub>3</sub>  
 (b) HClO<sub>3</sub> < HClO<sub>4</sub> < HClO<sub>2</sub> < HClO  
 (c) HClO < HClO<sub>2</sub> < HClO<sub>3</sub> < HClO<sub>4</sub>  
 (d) HClO<sub>2</sub> < HClO < HClO<sub>3</sub> < HClO<sub>4</sub>
33. Which is the correct statement for the given acids? **(2016-I)**  
 (a) Phosphinic acid is a diprotic acid while phosphonic acid is a monoprotic acid  
 (b) Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid  
 (c) Both are diprotic acids  
 (d) Both are triprotic acids
34. When copper is heated with conc. HNO<sub>3</sub> it produces: **(2016-I)**  
 (a) Cu(NO<sub>3</sub>)<sub>2</sub> and N<sub>2</sub>O  
 (b) Cu(NO<sub>3</sub>)<sub>2</sub> and NO<sub>2</sub>  
 (c) Cu(NO<sub>3</sub>)<sub>2</sub> and NO  
 (d) Cu(NO<sub>3</sub>)<sub>2</sub>, NO and NO<sub>2</sub>
35. Strong reducing behaviour of H<sub>3</sub>PO<sub>2</sub> is due to : **(2015 Re)**  
 (a) Presence of two -OH groups and one P-H bond  
 (b) Presence of one -OH group and two P-H bonds  
 (c) High electron gain enthalpy of phosphorus  
 (d) High oxidation state of phosphorus
36. The variation of the boiling points of the hydrogen halides is in the order HF > HI > HBr > HCl. What explains the higher boiling point of hydrogen fluoride? **(2015 Re)**  
 (a) The effect of nuclear shielding is much reduced in fluorine which polarizes the HF molecule  
 (b) The electronegativity of fluorine is much higher than for other elements in the group  
 (c) There is strong hydrogen bonding between HF molecules  
 (d) The bond energy of HF molecules is greater than in other hydrogen halides
37. In which of the following pairs, both the species are not isostructural? **(2015 Re)**  
 (a) XeF<sub>4</sub>, XeO<sub>4</sub>  
 (b) SiCl<sub>4</sub>, PCl<sub>4</sub><sup>+</sup>  
 (c) Diamond, silicon carbide  
 (d) NH<sub>3</sub>, PH<sub>3</sub>

38. Which of the statements given below is incorrect? **(2015 Re)**  
(a)  $O_3$  molecule is bent  
(b) ONF is isoelectronic with  $O_2N^-$   
(c)  $OF_2$  is an oxide of fluorine  
(d)  $Cl_2O_7$  is an anhydride of perchloric acid
39. Nitrogen dioxide and sulphur dioxide have some properties in common. Which property is shown by one of these compounds, but not by the other? **(2015)**  
(a) Is soluble in water  
(b) Is used as a food preservative  
(c) Forms 'acid-rain'  
(d) Is a reducing agent
40. Acidity of diprotic acids in aqueous solutions increases in the order: **(2014)**  
(a)  $H_2Se < H_2S < H_2Te$   
(b)  $H_2Te < H_2S < H_2Se$   
(c)  $H_2Se < H_2Te < H_2S$   
(d)  $H_2S < H_2Se < H_2Te$
41.  $XeF_2$  is isostructural with: **(2013)**  
(a)  $TeF_2$  (b)  $ICl_2^-$   
(c)  $SbCl_3$  (d)  $BaCl_2$
42. Which of the following does not give oxygen on heating? **(2013)**  
(a)  $KClO_3$  (b)  $Zn(ClO_3)_2$   
(c)  $K_2Cr_2O_7$  (d)  $(NH_4)_2Cr_2O_7$
43. Which is the strongest acid in the following? **(2013)**  
(a)  $H_2SO_4$  (b)  $HClO_3$   
(c)  $HClO_4$  (d)  $H_2SO_3$



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