

CONCEPT : HYDRIDES , OXIDES AND OXOACIDS**CHAP: P-BLOCK ELEMENTS CLASS-XII**

CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-1[1×5=5]	CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-2[1×5=5]
1# Whose boiling point is more ? (H_2O , H_2S) 2# Which is more basic ? (NH_3 , BiH_3) 3# Which is thermally more stable ? (H_2Se , H_2S) 4# Which is more reducing in nature ? (H_2O , H_2S) 5# Which is more acidic ? ($H-I$, $H-F$, $H-Cl$) 1- H_2O , 2- NH_3 , 3- H_2S , 4- H_2S , 5- $H-I$, 6- NH_3 , 7- NH_3 , 8-3, 9-phosphonic acid, 10- $HOClO_3$	6# Which has more bond angle ? (NH_3 , BiH_3 , PH_3) 7# Which dissolves more in water ? (PH_3 , NH_3) 8# What is the basicity of H_3PO_4 ? (1, 2, 3, 4) 9# Which is more reducing ? (Phosphinic acid, Phosphonic acid) 10# Which is more acidic ? ($HOCl$, $HOClO_3$)
CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-3[1×5=5]	CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-4[1×5=5]
11# Which one disproportionate on heating (H_3PO_3 , H_3PO_4) 12# Which has more B.P ? (water, HF) 13# Which is a better complexing agent ? (Ammonia, Phosphine) 14# Which can act both oxidizing as well as reducing agent ? (H_2S , SO_2) 15# What is Oleum? (Pyrosulphuric acid, Pyrophosphoric acid) 11- H_3PO_3 , 12- $H-F$, 13-ammonia, 14 SO_2 , 15-pyrosulphuric acid	16# H_2SO_4 is prepared by (Ostwald's Process, Contact Process) 17# What is the covalence of nitrogen in N_2O_5 ? (3, 4, 5) 18# Which one exists ? ($R_3P=O$, $R_3N=O$) 19# Which decolourise acidified $KMnO_4$ solution ? (moist SO_3 , moist SO_2) 20# When copper metal is treated with dilute nitric acid, what is produced along with $Cu(NO_3)_2$ and H_2O (NO_2 , NO) 16-contact process, 17-5, 18- $R_3P=O$, 19- moist SO_2 , 20- NO
CONCEPT: HYDRIDES , OXIDES AND OXOACIDS –P-BLOCK ;CL-XII ----CARD-5[1×5=5]	CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-6[1×5=5]
21# The spontaneous combustion of which gas is technically used in Holme's Signals ? (H_2S or PH_3) 22# Name the common acid used in pickling of stainless steel, oxidizer in rocket fuels and in explosives (H_2SO_4 or HNO_3) 23# Which gas is poisonous and has rotten fish smell (hydrogen sulphide, phosphine) 24# Which one of the oxides will not have two different N—O bond length ? (N_2O_5 , N_2O_3 , N_2O_4) 25# Which acid is more acidic ? (CrO , CrO_3 , Cr_2O_3) 21- PH_3 , 22- HNO_3 , 23-phosphine, 24- N_2O_4 , 25- CrO_3	26# The catalyst used in Contact Process are----- (Pt/ Rh-gauge at 500K and 9 bar, V_2O_5) 27# Which is the anhydride of HNO_3 (N_2O_3 , N_2O_5 , NO_2) 28# Which one is colourless gas, neutral, reactive, paramagnetic and dimerise (NO_2 , NO , N_2O_4) 29# Which one does not have P—O—P linkage (pyrophosphoric acid, polymetaphosphoric acid, Hypophosphoric acid) 30# Which acid is stronger ? (Perchloric acid, H_2SO_4) 26- V_2O_5 , 27- N_2O_5 , 28- NO , 29- hypo phosphoric acid, 30-perchloric acid
CONCEPT: HYDRIDES , OXIDES AND OXOACIDS –P-BLOCK ;CL-XII ----CARD-7[1×5=5]	CONCEPT: HYDRIDES , OXIDES AND OXOACIDS – P-BLOCK ;CL-XII ----CARD-8[1×5=5]
31# Spontaneous combustion of which one is technically used in Holme's Signals	36# The gases produced in the thermal decomposition reaction of $Pb(NO_3)_2$ and NH_4NO_3 are respectively (a) N_2O , NO (b) N_2O , NO

<p>(Ca_3P_2 , CaC_2 , PH_3)</p> <p>32# The acid contain -----bond have strong reducing properties ($\text{P}-\text{OH}$, $\text{P}-\text{H}$) .</p> <p>33# Which one is not responsible for ozone layer depletion? (NO_2 , NO , CFC)</p> <p>34# Which statement is incorrect about White Phosphorous: P_4 has (a) six $\text{P}-\text{P}$ single bonds (b) Four $\text{P}-\text{P}$ single bonds (c) four lone pairs of electrons (d) PPP angle of 60°</p> <p>35# The number of $\text{P}-\text{O}-\text{P}$ bonds in cycltri metaphosphoric acid is (a) zero (b) 2 (c) 3 (d) 4</p> <p>31-PH_3, 32-$\text{P}-\text{H}$, 33-NO_2, 34-b, 35- 3, 36- d, 37-a, 38-d, 39-c, 40-d</p>	<p>, NO_2 (c) NO, NO_2 (d) NO_2 , N_2O</p> <p>37# The ONO bond angle is maximum in (a) NO_3^- (b) NO_2^- (c) NO_2 (d) NO_2^+</p> <p>38# Which of the following has least bond angle (a) H_2O (b) H_2S (c) H_2Se (d) H_2Te</p> <p>39# Which statement is wrong for NO (a) It is anhydride of nitrous acid (b) It's dipole moment is 0.22 D (c) It forms dimer (d) It is paramagnetic</p> <p>40# Which of the following hydrogen halide is most volatile (a) HF (b) HCl (c) HBr (d) HI</p>								
<p align="center"><u>CONCEPT: HYDRIDES , OXIDES AND OXOACIDS -</u></p> <p align="center">P-BLOCK ;CL-XII ----CARD-9[1×5=5]</p>	<p align="center"><u>CONCEPT: HYDRIDES , OXIDES AND OXOACIDS -</u></p> <p align="center">P-BLOCK ;CL-XII ----CARD-10[1×5=5]</p>								
<p>41# Arrange in increasing order of basic strength -- NH_3 , BiH_3 , PH_3 , AsH_3 , SbH_3 -----</p> <p>42# Arrange In increasing order of acidic strength -- HBr , HCl , HF , HI . -----</p> <p>43# The optimum conditions for the production of ammonia are -----</p> <p>45# The chemical compound responsible for Brown -Ring in nitrate test is -----</p> <p>41-$\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$; 42-$\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$; 43- high pressure and low temperature of 773K; 45- $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]\text{SO}_4$</p>	<p>46#The conditions to maximize the yield of sulphuric acid by Contact Process are -----</p> <p>47# The two areas in which H_2SO_4 plays an important role are 1.----- 2.-----</p> <p>48# Out of HOF and HOCl , relatively stable oxo-acid is -----</p> <p>49# HClO_4 is more acidic than HOCl because -----</p> <p>50# Give one chemical equation to show the dehydrating action of conc. H_2SO_4 .-----</p> <p>46- high pressure and low temp, as activation energy is high preheated gases are used. 47-industries, and laboratories, 48-HOCl, 49-ClO_4^- ion is stabilized by resonance, 50-$\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{H}_2\text{SO}_4 \rightarrow 12\text{CO}_2 + 11\text{H}_2\text{O}$</p>								
<p align="center"><u>CONCEPT: HYDRIDES , OXIDES AND OXOACIDS -</u></p> <p align="center">P-BLOCK ;CL-XII ----CARD-11</p> <p align="center">MATCH THE FOLLOWING : I [1×5=5]</p>	<p align="center"><u>CONCEPT: HYDRIDES , OXIDES AND OXOACIDS -</u></p> <p align="center">P-BLOCK ;CL-XII ----CARD-12</p> <p align="center">MATCH THE FOLLOWING : II : [1×5=5]</p>								
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2. Conc. H_2SO_4	B. Acid having reducing properties	2. Phosphine	B. Pyrosulphuric acid
3. H_3PO_2	C. Odd electron molecule	3. Hydrogen sulphide	C. Rotten fish smell
4. HNO_3	D. Decolourise acidified KMnO_4 solution	4. Phosphonic acid	D. Ozone depleting compound
5. SO_2	E. Having dehydrating action	5. Nitric Oxide	E. Rotten egg smell

1-C, 2-E, 3-B, 4-A, 5-D

1-B, 2-C, 3-E, 4-A, 5-D

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-13 [1×5=5]****CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –****P-BLOCK ;CL-XII ----CARD-14**

Answer the following by Choosing from the parenthesis :-

(Fluorine ,Chlorine , Ammonia , Sulphuric acid , nitrous acid)

- Oxo acids obtained through Contact Process
 - Oxoacids which disproportionate
 - Hydrides of Gr-15 which give deep blue colour with Cu^{++}
 - Halogen that is prepared through Oxidation of HX by Deacon's Process
 - Halogen form only one oxoacids .
- 1- Sulphuric acid, 2- nitrous acid, 3-Ammonia, 4-Chlorine, 5-Fluorine

Just Name it [1×5=5]

- Hydrides of Gr-15 used in Holme's Signal
 - A powerful oxidizing compound which is produced when Conc. H_2SO_4 is electrolyzed ?
 - Oxoacids obtained through Ostwald's Process ?
 - Name the oxoacids , which is a constituent of Aquaregia
 - Strongest reducing hydrides of Gr-15 .
- 1- PH_3 , 2- $\text{H}_2\text{S}_2\text{O}_8$, 3- HNO_3 , 4- $\text{HNO}_3 + \text{HCl}$, 5- BiH_3

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-15 [1×5=5]****CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –****P-BLOCK ;CL-XII ----CARD-16 [1×5=5]****Give reason / Account for the following :**

- 1# In aqueous solution , HI is stronger acid than HCl .
 2# Hydrogen fluoride has a much higher boiling point than hydrogen Chloride .
 3# NH_3 is a stronger base than PH_3 .
 4# In the structure of HNO_3 molecule , The N—O bond (121pm) is shorter than N—OH bond(140pm)
 5# H_3PO_2 and H_3PO_3 act as good reducing agents while H_3PO_4 does not ?

Give reason / Account for the following :

- 6# Iron dissolves in HCl to form FeCl_2 and not FeCl_3 .
 7# H_2O is a liquid while , inspite of higher molecular mass , H_2S is gas .
 8# HBr and HI can't be prepared by treating metal bromides or iodides with conc. H_2SO_4 .
 9# Draw the structure of SO_2 molecule Comment on the nature of two S—O bonds formed in SO_2 molecule. Are the two S—O bonds in this molecule equal ?
 10# Why BiH_3 the strongest reducing agent among all the hydrides of group -15 elements ?

CONCEPT : HYDRIDES, OXIDES AND OXOACIDS CHAP: P-BLOCK ELEMENTS CLASS-XII**CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –P-BLOCK ;CL-XII ----CARD-17[1×5=5]****CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –****P-BLOCK ;CL-XII ----CARD-18[1×5=5]**

Give reason / Account for the following :

11# In solution of H_2SO_4 in water, the second dissociation constant K_{a2} , is less than the first dissociation constant K_{a1}
 12# H_2O is a liquid while, inspite of higher molecular mass, H_2S is gas.
 13# In which one of the following structures, NO_2^+ and NO_2^- , the bond angle has higher value?
 14# NH_3 is a stronger base than PH_3 . OR,
 15# Why the bond angle of PH_3 molecule is lesser than that in NH_3 molecule?

Give reason / Account for the following :

16# Describe the favourable conditions for the manufacture of (i) ammonia by Habber's Process (ii) Sulphuric acid by Contact Process (2)
 17# Which is stronger acid in aqueous solution (HCl , HI)
 18# Arrange HClO_3 , HClO_2 , HClO , HClO_4 in order of increasing acid strength. Give reason for your answer (2m)
 19# Although the H-bonding in hydrogen fluoride is much stronger than that in water, yet water has a much higher boiling point than hydrogen fluoride. Why?
 20# Why do chlorine water on standing loses its yellow colour?

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –P-BLOCK ;CL-XII ----CARD-19 [1×5=5]

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –

P-BLOCK ;CL-XII ----CARD-20[1×5=5]

Arrange the Following in increasing order against the properties mentioned :-

1# Bond Dissociation Enthalpy:-

(a) $\text{Br}-\text{Br}$, $\text{I}-\text{I}$, $\text{Cl}-\text{Cl}$, $\text{F}-\text{F}$

(b) $\text{H}-\text{I}$, $\text{H}-\text{F}$, $\text{H}-\text{Br}$, $\text{H}-\text{Cl}$

(c) $\text{O}-\text{H}$, $\text{H}-\text{Te}$, $\text{H}-\text{Se}$, $\text{H}-\text{S}$.

(d) $\text{N}-\text{N}$, $\text{P}-\text{P}$, $\text{As}-\text{As}$

2# Base Strength:-

BiH_3 , NH_3 , AsH_3 , SbH_3 , PH_3

Ans: 1) $\text{a}-\text{I}_2 < \text{Br}_2 < \text{F}_2 < \text{Cl}_2$; $\text{b}-\text{HI} < \text{HBr} < \text{HCl} < \text{HF}$; $\text{c}: \text{H}-\text{Te} < \text{H}-\text{Se} < \text{H}-\text{S} < \text{O}-\text{H}$;

$2\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$

Arrange the Following in increasing order against the properties mentioned :-

1# Acid strength:-

(a) $\text{H}-\text{I}$, $\text{H}-\text{F}$, $\text{H}-\text{Br}$, $\text{H}-\text{Cl}$

(b) HF , CH_4 , H_2O , NH_3

(c) H_2O , H_2Te , H_2Se , H_2S

2# Thermal Stability:-

(a) H_2O , H_2Te , H_2Se , H_2S

(b) PH_3 , BiH_3 , AsH_3 , SbH_3 , NH_3

Ans: 1) a) $\text{H}-\text{F} < \text{H}-\text{Cl} < \text{HBr} < \text{HI}$, b) $\text{NH}_3 < \text{CH}_4 < \text{H}_2\text{O} < \text{HF}$, c) $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$

2) a- $\text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{O}$; b- $\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –P-BLOCK ;CL-XII ----CARD-21 [1×5=5]

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –

P-BLOCK ;CL-XII ----CARD-22 [1×5=5]

Arrange the Following in increasing order against the properties mentioned :-

1# Bond Angle:- (a) H_2Se , H_2O , H_2S , H_2Te

(b) PH_3 , BiH_3 , AsH_3 , SbH_3 , NH_3

2# Boiling Point :- (a) H_2S , H_2O , H_2Te , H_2Se

(b) PH_3 , BiH_3 , AsH_3 , SbH_3 , NH_3

3# Volatility:- H_2O , H_2Te , H_2Se , H_2S

Arrange the Following in increasing order against the properties mentioned :-

1# Covalent Character :- (a) Cr_2O_3 , CrO , CrO_3

(b) P_2O_5 , Sb_2O_5 , As_2O_5

(c) BeCl_2 , MgCl_2 , CaCl_2 , BaCl_2

2# Acid Strength:-

(a) HOClO_2 , HOClO , HOCl , HOClO_3

(b) HOCl , HOI , HOBr

<p align="center"><u>CONCEPT: HYDRIDES, OXIDES AND OXOACIDS</u> –P-BLOCK ;CL-XII ----CARD-23 [1×5=5]</p>	<p align="center"><u>CONCEPT: HYDRIDES, OXIDES AND OXOACIDS</u> – P-BLOCK ;CL-XII ----CARD-24 [1×5=5]</p>
<p>Arrange the Following in increasing order against the properties mentioned :-</p> <p>1# Reducing properties:</p> <p>(a) H_2O, H_2Te, H_2Se, H_2S</p> <p>(b) H_3PO_4, H_3PO_2, H_3PO_3</p> <p>2# Acidic Character --</p> <p>(a) N_2O, N_2O_5, N_2O_3, NO, N_2O_4</p> <p>(b) ClO_2, Cl_2O_7, Cl_2O, Cl_2O_6</p> <p>(c) HNO_2 & HNO_3</p>	<p>Arrange the Following in increasing order against the properties mentioned :-</p> <p>1# Acidic Character --</p> <p>(a) H_2SO_3 & H_2SO_4</p> <p>(b) GeO_2, ClO_2, As_2O_3, Ga_2O_3</p> <p>(c) P_2O_5, SO_3, N_2O_5, CO_2, SiO_2</p> <p>(d) Al_2O_3, CaO, Cl_2O_7, SO_3</p> <p>(e) BF_3, BBr_3, BCl_3</p>
<p align="center"><u>CONCEPT: HYDRIDES, OXIDES AND OXOACIDS</u> –P-BLOCK ;CL-XII ----CARD-25 [5M]</p>	<p align="center"><u>CONCEPT: HYDRIDES, OXIDES AND OXOACIDS</u> – P-BLOCK ;CL-XII ----CARD-26 [5M]</p>
<p align="center"><u>IDENTIFY THE FOLLOWING COMPOUNDS</u></p> <p>1# (A) reacts with H_2SO_4 to form purple coloured solution (B) which reacts with KI to form colourless compound (C). The colour of (B) disappears with acidic solution of FeSO_4. With concentrated H_2SO_4 (B) forms (D) which can decompose to give a black compound (E) and O_2. Identify (A) to (E) and write equations for the reactions involved.</p>	<p align="center"><u>IDENTIFY THE FOLLOWING COMPOUNDS</u></p> <p>2# When conc. sulphuric acid was added to an unknown salt present in a test tube, a brown gas (A) was evolved. This gas intensified when copper turnings were also added into this tube. On cooling, the gas 'A' changed into a colourless gas 'B'.</p> <p align="center">(a) Identify the gases A and B. (b) Write the equations for the reactions involved. (3M)</p>
<p align="center"><u>CONCEPT: HYDRIDES, OXIDES AND OXOACIDS</u> –P-BLOCK ;CL-XII ----CARD-27 [5M]</p>	
<p align="center"><u>IDENTIFY THE FOLLOWING COMPOUNDS</u></p> <p>3# A colourless inorganic salt (A) decomposes completely at about 25°C to give only two products, (B) and (C), leaving no residue. The oxide (C) is a liquid at room temperature and neutral to moist litmus paper while the gas (B) is a neutral</p>	

oxide. White phosphorus burns in excess of (B) to produce a strong white dehydrating agent. Write balanced equations for the reactions involved in the above process. Gradual addition of KI to $\text{Bi}(\text{NO}_3)_3$ solution initially produces a dark brown precipitate which dissolves in excess of KI to give a clear yellow solution. Write chemical equations for the above.

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-11****MATCH THE FOLLOWING : I [1×5=5]**

COLUMN-I	COLUMN-II
1. NO_2	C. Odd electron molecule
2. Conc. H_2SO_4	E. Having dehydrating action
3. H_3PO_2	B. Acid having reducing properties
4. HNO_3	A. Oxidizing agent
5. SO_2	D. Decolourise acidified KMnO_4 solution

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-13 [1×5=5]****Answer**

6. Oxo acids obtained through Contact Process - **Sulphuric acid**
7. Oxoacids which disproportionate --**nitrous acid**
8. Hydrides of Gr-15 which give deep blue colour with Cu^{++} -- **Ammonia**
9. Halogen that is prepared through Oxidation of HX by Deacon's Process ---**Chlorine**
10. Halogen form only one oxoacids .--- **Fluorine** ,

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-12****Answer MATCH THE FOLLOWING : II : [1×5=5]**

COLUMN-I	COLUMN-II
1. Oleum	B. Pyrosulphuric acid
2. Phosphine	C. Rotten fish smell
3. Hydrogen sulphide	E. Rotten egg smell
4. Phosphonic acid	A. Disproportionate when heated
5. Nitric Oxide	D. Ozone depleting compound

CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –**P-BLOCK ;CL-XII ----CARD-14****Just Name it [1×5=5]**

6. Hydrides of Gr-15 used in Holme's Signal -- PH_3
7. A powerful oxidizing compound which is produced when Conc. H_2SO_4 is electrolyzed ?— **Peroxodisulphate ion**
8. Oxoacids obtained through Ostwald's Process ? -- **sulphuric acid**
9. Name the oxoacids , which is a constituent of Aquaregia . HNO_3 .
10. Strongest reducing hydrides of Gr-15 . -- BiH_3

ANSWERS: CONCEPT: HYDRIDES, OXIDES AND OXOACIDS –

P-BLOCK ;CL-XII ----CARD-19 –Answer

1# (a) $\text{I—I} < \text{F—F} < \text{Br—Br} < \text{Cl—Cl}$ (Bond Dissociation Enthalpy)—Inter-electronic repulsion

(b) $\text{H—I} < \text{H—Br} < \text{H—Cl} < \text{H—F}$

© $\text{H—Te} < \text{H—Se} < \text{H—S} < \text{H—O}$

(d) $\text{As—As} < \text{N—N} < \text{P—P}$

2# $\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$ (Base Strength) – small size of N – High electron density in Ammonia

P-BLOCK ;CL-XII ----CARD-20–Answer

1# (a) $\text{H—F} < \text{H—Cl} < \text{H—Br} < \text{H—I}$ (Acid strength)—Lower BDE of HI, large size of I

(B) $\text{CH}_4 < \text{NH}_3 < \text{H}_2\text{O} < \text{HF}$

© $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$

2# (a) $\text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{O}$ (Thermal Stability) ---BDE

(b) $\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$

P-BLOCK ;CL-XII ----CARD-21–Answer

1#(a) $\text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{O}$ (Bond Angle)----- Size of central atom, electronegativity, repulsion of bond pairs.

(b) $\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$

2# (a) $\text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{O}$ (Boiling Point) -- H-Bond and Vander waal's force

(b) $\text{PH}_3 < \text{AsH}_3 < \text{NH}_3 < \text{SbH}_3 < \text{BiH}_3$ (Boiling Point) -- H-Bond and Vander waal's force

3#(a) $\text{H}_2\text{O} < \text{H}_2\text{Te} < \text{H}_2\text{Se} < \text{H}_2\text{S}$ (Volatility)--- H-Bond and Vander waal's force

P-BLOCK ;CL-XII ----CARD-22–Answer

1# (a) $\text{CrO} < \text{Cr}_2\text{O}_3 < \text{CrO}_3$ (b) $\text{As}_2\text{O}_5 < \text{Sb}_2\text{O}_5 < \text{P}_2\text{O}_5$ (c) $\text{BaCl}_2 < \text{CaCl}_2 < \text{MgCl}_2 < \text{BeCl}_2$

2# (a) $\text{HOCl} < \text{HOClO} < \text{HOClO}_2 < \text{HOClO}_3$ (Acid Strength) – Stability of its conjugate base, charge dispersal, Oxidation states.

(b) $\text{HOI} < \text{HOBr} < \text{HOCl}$ (Acid Strength) ---Stronger the O—X bond – Weaker the O—H bond – More the acidic character.

P-BLOCK ;CL-XII ----CARD-23–Answer

1# (a) $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$ (Acid Strength and Reducing Character) --- BDE

(b) $\text{H}_3\text{PO}_4 < \text{H}_3\text{PO}_3 < \text{H}_3\text{PO}_2$

2#(a) $\text{N}_2\text{O} < \text{NO} < \text{N}_2\text{O}_3 < \text{N}_2\text{O}_4 < \text{N}_2\text{O}_5$ (Acidic Character) – Higher oxidation states, covalent character

(b) $\text{Cl}_2\text{O} < \text{ClO}_2 < \text{Cl}_2\text{O}_6 < \text{Cl}_2\text{O}_7$ (Acid Strength)-- Higher oxidation states, covalent character

(c) $\text{HNO}_2 < \text{HNO}_3$

P-BLOCK ;CL-XII ----CARD-24–Answer

- (a) $\text{H}_2\text{SO}_3 < \text{H}_2\text{SO}_4$ (Acidic character)
 (b) $\text{Ga}_2\text{O}_3 < \text{GeO}_2 < \text{As}_2\text{O}_3 < \text{ClO}_2$ (Acidic Character)
 © $\text{SiO}_2 < \text{CO}_2 < \text{P}_2\text{O}_5 < \text{N}_2\text{O}_5 < \text{SO}_3$
 (d) $\text{CaO} < \text{Al}_2\text{O}_3 < \text{SO}_3 < \text{Cl}_2\text{O}_7$
 (e) $\text{BF}_3 < \text{BCl}_3 < \text{BBr}_3$ (Acidic Character)—Effective 2p—2p overlap in BF_3 reduces the electron deficiency of B , make it less acidic.

CONCEPT : ANOMALOUS PROPERTIES CHAP: P-BLOCK ELEMENTS CLASS-XII

<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-1 [1×5=5]	<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-2 [1×5=5]
II # CHOOSE THE CORRECT ANSWER FROM GIVEN OPTIONS . 1# Whose boiling point is more ? (H_2O , H_2S) 2# Which dissolves more in water ? (PH_3 , NH_3) 3# Which is more basic ? (NH_3 , BiH_3) 4# Which has more oxidizing ability (Cl_2 , F_2) 5# Which has more bond dissociation enthalpy ? (F—F , Cl—Cl)	II # CHOOSE THE CORRECT ANSWER FROM GIVEN OPTIONS . 6# Which one exists ? ($\text{R}_3\text{P=O}$, $\text{R}_3\text{N=O}$) 7# Which is more reactive ? (Red—P, White—P) 8# Which has more catenation properties ? (N or P) 9# Which is possible (ClF_3 or FCl_3) 10# Which is more reactive (Nitrogen gas, Phosphorus)
<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-3 [1×5=5]	<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-4 [1×5=5]
II # CHOOSE THE CORRECT ANSWER FROM GIVEN OPTIONS . 11# Whose sigma bond strength is more?(O—O , S—S) 12# Whose Ionisation energy is more ? (N , O) 13# Which one does not release white fumes of HCl	Give Reason for each of the following :- 1 # NCl_5 does not exist but NCl_3 exists BUT both PCl_3 & PCl_5 exists . 2# Why does $\text{R}_3\text{P} = \text{O}$ exist but $\text{R}_3\text{N} = \text{O}$ does not (R = alkyl group)?

<p>upon hydrolysis (PCl_5, PCl_3, SiCl_4, NCl_5)</p> <p>14# Which is more stable ? (NF_3, NCl_3)</p> <p>15# Which has more negative gain enthalpy ? (F, Cl)</p>	<p>3# Nitrogen exists as diatomic molecule and phosphorus as P_4. Why?</p> <p>4# Oxygen & nitrogen are gases BUT sulphur and phosphorus are found in solid state at room temp.</p> <p>5# BiCl_3 is more stable than BiCl_5. Explain</p>
<p><u>ANOMALOUS PROPERTIES</u></p> <p>P-BLOCK ;CL-XII ----CARD-5 [1×5=5]</p>	<p><u>ANOMALOUS PROPERTIES</u></p> <p>P-BLOCK ;CL-XII ----CARD-6 [1×5=5]</p>
<p>Give Reason for each of the following :-</p> <p>6 # Although electron gain enthalpy of fluorine is less negative as compared to chlorine, fluorine is a stronger oxidising agent than chlorine.</p> <p>7# Explain why fluorine forms only one oxoacid, HOF.</p> <p>8# ClF_3 exists but FCl_3 does not Explain</p> <p>9# Why does nitrogen show catenation properties less than phosphorus?</p> <p>10 # The electron gain enthalpy of Sulphur is more than Oxygen .</p>	<p>Give Reason for each of the following :-</p> <p>11# Are all the five bonds in PCl_5 molecule equivalent? Justify your answer</p> <p>12# The $\text{O}-\text{O}$ bond energy is less than the $\text{S}-\text{S}$ bond energy. (sigma bond) OR Sulphur exhibits a stronger tendency for catenation as compared to oxygen.</p> <p>13 # NH_3 is a good complexing agent but NF_3 is not .</p> <p>14# On being slowly passed through water PH_3 forms bubbles but NH_3 dissolves .</p> <p>15# Why does NH_3 form hydrogen bond but PH_3 does not?</p>
<p><u>ANOMALOUS PROPERTIES</u></p> <p>P-BLOCK ;CL-XII ----CARD-7 [1×5=5]</p>	<p><u>ANOMALOUS PROPERTIES</u></p> <p>P-BLOCK ;CL-XII ----CARD-8 [1×5=5]</p>
<p>Give Reason for each of the following :-</p> <p>16# Why does NH_3 act as a Lewis base ? <u>OR</u> NH_3 acts as ligand or good complexing agent</p> <p><u>OR</u>, NH_3 has higher H^+ affinity than PH_3.</p> <p>17# Why is H_2O a liquid and H_2S a gas ?</p> <p>18# SCl_6 is not known but SF_6 is known .</p> <p>19# SF_6 exists but SH_6 does not</p> <p>20# SF_6 is known but OF_6 is not formed .Explain.</p>	<p>Give Reason for each of the following :-</p> <p>21# I_3^- is known but F_3^- is not.</p> <p>22# HF is least volatile , whereas HCl is the most volatile. OR, HF has higher B.P than HCl OR, HF is liquid and HCl is gas</p> <p>23# Oxygen and fluorine both stabilize higher oxidation states of metals but oxygen exceeds fluorine in doing so .</p> <p>24 # Bismuth is a strong oxidizing agent in pentavalent state.</p> <p>25# PH_3 has lower boiling point than NH_3. Why?</p>

CONCEPT : ANOMALOUS PROPERTIES CHAP: P-BLOCK ELEMENTS CLASS-XII

<u>ANOMALOUS PROPERTIES</u>	<u>ANOMALOUS PROPERTIES</u>
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P-BLOCK ;CL-XII ----CARD-9 [1×5=5]	P-BLOCK ;CL-XII ----CARD-10 [1×5=5]
<p>Give Reason for each of the following :-</p> <p>26 # Explain why NH_3 is basic while BiH_3 is only feebly basic.</p> <p>27 # Why does the reactivity of nitrogen differ from phosphorus?</p> <p>28# Why does white ppt. of AgCl dissolves in ammonia solution.</p> <p>29# Though nitrogen exhibits +5 oxidation state, it does not form pentahalide. Give reason.</p> <p>30# There is a large difference between the melting and boiling points of Oxygen and Sulphur .</p>	<p>Give Reason for each of the following :-</p> <p>31# Why is N_2 less reactive at room temperature?</p> <p>32# Fluorine exhibits only -1 oxidation state whereas other halogens exhibit $+1$, $+3$, $+5$ and $+7$ oxidation states also. Explain.</p> <p>33# Considering the parameters such as bond dissociation enthalpy, electron gain enthalpy and hydration enthalpy, compare the oxidising power of F_2 and Cl_2.</p> <p>34# Fluorine never acts as a central atom in its compounds with other halogens .</p> <p>35 # In trimethylamine, the nitrogen has a pyramidal geometry whereas in trisilylamine, it has a planar</p>
<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-11 [1×5=5]	<u>ANOMALOUS PROPERTIES</u> P-BLOCK ;CL-XII ----CARD-12 [1×5=5]
<p># Arrange the Following in increasing order against the properties mentioned :-</p> <p>1# Catenation property:-</p> <p>(a) As , N, P , Sb</p> <p>(b) Se ,S , Te ,O</p> <p>2# Electronegativity:- (a) Cl ,F, Br, I</p> <p>(b) O , N , F , C</p> <p>3# Stability:- $\text{F}^-_{(\text{aq})}$, $\text{I}^-_{(\text{aq})}$, $\text{Cl}^-_{(\text{aq})}$, $\text{Br}^-_{(\text{aq})}$</p>	<p># Arrange the Following in increasing order against the properties mentioned :-</p> <p>1# Electron Gain Enthalpy :-</p> <p>(a) I , Br , Cl , F (b) N , O, P ,S</p> <p>(c) F, Cl , O , S</p> <p>2# Ionisation Enthalpy:-</p> <p>(a) O , N , F , C</p> <p>(b) Ar , Ne , He , Xe , Kr</p>

Q.1 # H_2O	Q.2# NH_3	Q.3# H_2S	Q.4# H_2S	Q.5# H—I

Q.6# NH_3	Q.7# NH_3	Q.8# 3	Q.9# Phosphinic acid	Q.10# HOCIO_3
Q.11# H_3PO_3	Q.12# water	Q.13# Ammonia	Q.14# SO_2	Q.15# Pyrosulphuric acid
Q.16# Contact Process	Q.17# 4	Q.18# $\text{R}_3\text{P}=\text{O}$	Q.19# moist SO_2	Q.20# NO
Q.21# PH_3	Q.22# HNO_3	Q.23# phosphine	Q.24# N_2O_4	Q.25# CrO_3
Q.26# V_2O_5	Q.27# N_2O_5	Q.28# NO	Q.29# Hypophosphoric acid	Q.30# Perchloric acid
Q.31# PH_3	Q.32# P—H	Q.33# NO_2	Q.34# Four P—P single bonds	Q.35# 3
Q.36# NO_2 , N_2O	Q.37# NO_2^+	Q.38# H_2Te	Q.39#(a) It is anhydride of nitrous acid	Q.40# HCl
Q.41# , BiH_3 , SbH_3 , AsH_3 , PH_3 , NH_3	Q.42# HF , HCl , HBr, HI	Q.43# 200 atm , 700K , Fe_2O_3 with small amount of K_2O , Al_2O_3	Q.44#	Q.45# $[\text{Fe}(\text{H}_2\text{O})_5(\text{NO})]^{2+}$
Q.46# 2 bar , 720 K , V_2O_5 catalyst for converting SO_2 to SO_3 and absorbing SO_3 in Conc. H_2SO_4	Q.47# Fertiliser making , Lead storage battery	Q.48# HOCl	Q.49# ClO_4^- is resonance stabilized due to 4 oxygen atoms	Q.50# $\text{C}_{12}\text{O}_{11}\text{H}_{22} + \text{conc. H}_2\text{SO}_4 \rightarrow 12\text{C} + 11\text{H}_2\text{O}$