Single correct :

Q.1 Select **correct** statement for PCl_5 and PF_5

(A) Having same type of structure in solid state as well as in gaseous state.
(B) Having same type of structure in solid state but not in gaseous state.
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(B) S_2 molecule is paramagnetic.
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(I) (A) on heating gives gas (X).
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Correct code is

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Q.5 Which of the following statement is **incorrect** for XeF_6 ?

(A) Its partial hydrolysis gives $XeOF_4$ and XeO_2F_2 which is non-redox hydrolysis.
(B) Its reaction with silica gives $XeOF_4$.
(C) It is prepared by reaction of XeF_4 and O_2F_2.
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Q.6 Which of the following regarding diborane is **correct ?**

(I) It is a colourless and toxic gas.
(II) It undergoes spontaneous combustion in presence of oxygen forming B_2O_3.
(III) It can be obtained by reduction of BF_3 by following reaction.

$$2BF_3 + 6NaH \xrightarrow{180^oC} B_2H_6 + 6NaF$$

(IV) It undergoes hydrolysis forming boric acid and hydrogen gas.

Correct code is

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Q.7 Identify the **incorrect** statement(s) among the following

(I) Moist ammonia gas can be dried by using anhydrous $CaCl_2$.
(II) When metallic copper reacts with very dilute nitric acid, ammonium nitrite is one of the products.
(III) Phosphine is more soluble in water than NH_3.
(IV) NaH_2PO_2 is an acidic salt and it is named as a sodium hypophosphate.

Correct code is

(A) I and III (B) I and IV (C) II and III (D) All of these

Q.8 $XeF_6 \xrightarrow[-HF]{H_2O} x \xrightarrow[-HF]{H_2O} y \xrightarrow[-HF]{H_2O} z$

Select correct statement(s) for x, y, z

(A) All are planar and polar
(B) All are planar and non polar
(C) All are nonplanar and polar
(D) All are nonplanar and nonpolar

Q.9 When aqueous solution of NH_4Cl reacts with $NaNO_2$ two gases are formed, one is in large amount and other is in small amount, these gases are respectively ?

(A) N_2, NO (B) N_2, N_2O (C) N_2O, NO (D) NO, N_2

Q.10 Element (x) + NaOH → Gas 'y' + other product(s) ....(I)

Gas 'y' $\xrightarrow{hv}$ element 'x' + other product(s) ....(II)

Element 'x' obtained in rxn(I) and (II) are allotropes, then element 'x' is

(A) Zinc (B) phosphorous (C) sulphur (D) chlorine

Q.11 Which is not possible product of heating of ortho boric acid ?

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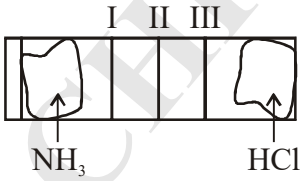

Select nearest position where white solid is formed

(A) I (B) II (C) III (D) White solid does not formed

Q.13 Which group-15 element 'X' reacts more readily in the following reaction ?

$4X + 5O_2 + 12OH^- \rightarrow 4\ XO_4^{3-} + 6H_2O$

(A) Nitrogen (B) Phosphorous (C) Arsenic (D) Bismuth

Q.14 $POCl_3$ is **not** obtained from PCl_5 by its reaction with

(A) H_2O (B) CH_3COOH (C) P_4O_{10} (D) $SnCl_2$

Q.15 Bleaching powder **does not** react with

(A) $CoCl_2$ (B) Acidified $K_2Cr_2O_7$ (C) KOH (D) C_2H_5OH

Q.16 Which is not example of SiO_2 ?

(A) Quartz (B) Silica-gel (C) Kieselghur (D) Carborundum

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(A) H_3PO_3 (B) H_3PO_4 (C) $HClO_2$ (D) $HClO_3$

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(A) H_2O (steam) (B) dil. HNO_3 (C) HCl (D) Conc. HNO_3

Q.19 Which ion will undergo reduction reaction vigorously ?

(A) Hypochlorite (B) Chlorite (C) Chlorate (D) Perchlorate

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(A) It shifts the position of equilibrium towards forward
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Q.21 Which amphoteric oxide does not dissolve in conc. HNO_3 ?
(A) PbO (B) PbO_2 (C) SnO (D) SnO_2

Q.22 Which pair of compound undergoes partial hydrolysis ?
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Q.23 For reaction : $NaCl(s) + H_2SO_4(conc.) + MnO_2 \xrightarrow{warm}$ products
Incorrect statement(s)
(A) Cl_2 gas is prepared by the given reaction
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(C) Both concentrated H_2SO_4 and MnO_4 act as oxidizing agent in the reation
(D) Cl_2 gas is dried by passing it through concentrated H_2SO_4

Q.24 In which of the following reaction more than one type of gaseous products are released
(A) $Al_2O_3 + C + N_2(g) \xrightarrow{\Delta}$ (B) $NaBH_4 + I_2 \xrightarrow{diglyme}$
(C) $NCl_3 + H_2O \xrightarrow{R.T.}$ (D) $H_3PO_3 \xrightarrow{\Delta}$

Q.25 **Wrong** statement about NH_3 is
(A) In the presence of platinum NH_3 is oxidized to NO_2 by air at 800°C
(B) NH_3 gas forms black precipitate with calomel
(C) NH_3 gas is dried over dry CaO
(D) NH_3 gas reaction with heated alkali metals

Comprehension

Comprehension (Q.26 to Q.27)
The **Contact process** is the current method of producing sulfuric acid of high concentration needed for industrial uses. Plantinum metal was used as catalyst for this reaction, however as it is susceptible to reacting with arsenic impurities in the sulfur feedstock, vanadium penta oxide (V_2O_5) is now preferred.

Q.26 Which substance is/are used as raw material in the manufacture of sulphuric acid
(A) Air (B) Sulphide ore (C) SO_2 (D) Water

Q.27 In which step catalyst is not used in the manufacture of sulphuric acid

$$\text{Sulphide ore} \xrightarrow{\text{Step (P)}} SO_2 \xrightarrow{\text{Step (Q)}} SO_3 \xrightarrow{\text{Step (R)}} H_2S_2O_7 \xrightarrow{\text{Step (S)}} H_2SO_4$$

(A) Step (P) (B) Step (Q) (C) Step (R) (D) Step (S)

More than one may be correct

Q.28 $XeF_6 + SiO_2 \rightarrow P + Q$
If 'P' and 'Q' are final products of above given reaction at required conditions and 'P' is an explosive compound, then **correct** statement(s) is/are
(A) XeF_6 is not handled in glass or quartz apparatus.
(B) Compound 'P' undergoes disproportionation in alkaline medium
(C) The given reaction exhibits fluorinating property of XeF_6
(D) Xenon oxyfluorides are formed prior to final product 'P' in the above reaction

Q.29 $PCl_3 + H_3PO_3 \longrightarrow 'X' + 'Y' \xrightarrow{\text{Excess water}} 'Z'$
If 'Y' and 'Z' are oxyacids then for given reaction **correct** statement(s) is/are
(A) Compound 'Y' is hypophosphorus acid
(B) Oxyacid 'Z' can reduce $AgNO_3$ into metallic silver
(C) Both oxyacids 'Y' and 'Z' contain nonionizable hydrogen atom(s)
(D) Compound 'X' also contains nonionizable hydrogen atom(s)

Q.30 $4HNO_3(conc.) + P_4O_{10} \xrightarrow{-10°C} X + Y$

If compound 'X' exhibits oxidizing character, then correct statement(s) for above balanced reaction is/ are :

(A) Compound 'X' is colourless and light sensitive

(B) The basicity of a molecule of compound 'Y' is four

(C) Both 'X' and 'Y' oxidize I_2 into I_2O_5

(D) Compound 'X' reacts with H_2O_2 and forms oxyacid of basicity one

Q.31 Correct statement(s) for ClF_3 is/are

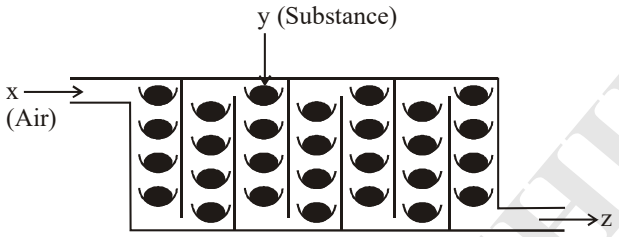
(A) It oxidizes NH_3 into N_2

(B) It acts as fluoride donor with BF_3

(C) It acts as fluoride acceptor with NOF

(D) Its aqueous solution exhibits strong oxidizing character

Q.32



x, y, z are respectively

(A) Moist air, $CaCl_2$, dry air

(B) Acidic air, CaO, Neutralized air

(C) Basic air, conc.H_2SO_4, Neutralized air

(D) Moist NH_3, P_4O_{10}, NH_3

Q.33 In which of the following reaction chloride compound is formed

(A) NH_3 (excess) + Cl_2

(B) NH_3 + Cl_2 (excess)

(C) Cold NaOH + Cl_2

(D) Hot NaOH + Cl_2

Q.34 Which of them has/have reducing nature.

(A) Phosphinic acid

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Match the column

Q.35

	Column-I		**Column-II**
(A)	Insoluble in H_2O	(P)	White phosphorous
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Q.36 $PCl_5 + Hg \xrightarrow{\Delta}$ 'X' + 'Y'

If 'Y' is nonpolar molecule then find out the value of total number of bond angles that are less than 109° in molecule 'X' .

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$(NH_4)_2Cr_2O_7$, NH_4MnO_4, NH_4ClO_4, NH_4IO_3, NH_4CN, $(NH_4)_2CO_3$, $(NH_4)_2S$, NH_4NO_2, NH_4NO_3

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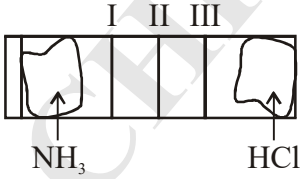

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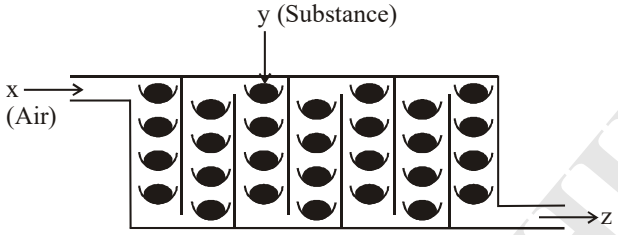

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(B)	Insoluble in CS_2	(Q)	Red phosphorous
(C)	Soluble in H_2O	(R)	Rhombic sulphur
(D)	Soluble in CS_2	(S)	Br_2
		(T)	I_2

Ans. A → P, Q, R, T ; B → Q ; C → S ; D → P, R, S, T

Subjective

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Ans. 3

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Ans 6