Q1 - 24 June - Shift 1

Given below are the oxides:

Na_2O, As_2O_3, N_2O, NO and Cl_2O_7

Number of amphoteric oxides is:

(A) 0 (B) 1

(C) 2 (D) 3

Space for your notes:

Q2 - 24 June - Shift 1

Identify the correct statement for B_2H_6 from those given below.

(A) In B_2H_6, all B-H bonds are equivalent.

(B) In B_2H_6 there are four 3-centre-2-electron bonds.

(C) B_2H_6 is a Lewis acid.

(D) B_2H_6 can be synthesized form both BF_3 and $NaBH_4$.

(E) B_2H_6 is a planar molecule.

Choose the most appropriate answer from the options given below :

(A) (A) and (E) only (B) (B), (C) and (E) only

(C) (C) and (D) only (D) (C) and (E) only

Space for your notes:

Q3 - 24 June - Shift 1

Which one of the following elemental forms is not present in the enamel of the teeth?

(A) Ca^{2+} (B) P^{3+}

(C) F^- (D) P^{5+}

Space for your notes:

Q4 - 24 June - Shift 2

PCl_5 is well known. but NCl_5 is not. Because.

(A) nitrogen is less reactive than phosphorous.

(B) nitrogen doesn't have d-orbitals in its valence shell.

(C) catenation tendency is weaker in nitrogen than phosphorous.

(D) size of phosphorous is larger than nitrogen.

Space for your notes:

Q5 - 25 June - Shift 2

Consider the following reactions :

$PCl_3 + H_2O \longrightarrow A + HCl$

$A + H_2O \longrightarrow B + HCl$

number of ionisable protons present in the product B_____.

Space for your notes:

Q6 - 26 June - Shift 1

Consider the following reaction :

$$2HSO_4^-(aq) \xrightarrow[(2)\ \text{Hydrolysis}]{(1)\ \text{Electrolysis}} 2HSO_4^- + 2H^+ + \mathbf{A}$$

The dihedral angle in product **A** in its solid phase at 110 K is :

(A) 104° (B) 111.5°

(C) 90.2° (D) 111.0°

Space for your notes:

Q7 - 26 June - Shift 1

The correct order of melting points of hydrides of group 16 elements is :

(A) $H_2S < H_2Se < H_2Te < H_2O$

(B) $H_2O < H_2S < H_2Se < H_2Te$

(C) $H_2S < H_2Te < H_2Se < H_2O$

(D) $H_2Se < H_2S < H_2Te < H_2O$

Space for your notes:

Q8 - 26 June - Shift 1

Consider the following reaction :

A + alkali $\rightarrow$ B (Major Product)

If B is an oxoacid of phosphorus with no P–H bond, then A is :

(A) White P_4 (B) Red P_4

(C) P_2O_3 (D) H_3PO_3

Space for your notes:

Q9 - 26 June - Shift 1

Polar stratospheric clouds facilitate the formation of :

(A) $ClONO_2$ (B) HOCl

(C) ClO (D) CH_4

Space for your notes:

Q10 - 27 June - Shift 1

Match List-I with List-II

List-I **(Si-Compounds)**	List-II **(Si-Polymeric/other products)**
(A) $(CH_3)_4Si$	(I) Chain silicone
(B) $(CH_3)Si(OH)_3$	(II) Dimeric silicone
(C) $(CH_3)_2Si(OH)_2$	(III) Silane
(D) $(CH_3)_3Si(OH)$	(IV) 2D – Silicone

Choose the correct answer from the options given below:

(A) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)
(B) (A) – (IV), (B) – (I), (C) – (II), (D) – (III)
(C) (A) – (II), (B) – (I), (C) – (IV), (D) – (III)
(D) (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

Space for your notes:

Q11 - 27 June - Shift 1

Heating white phosphorus with conc. NaOH solution gives mainly

(A) Na_3P and H_2O (B) H_3PO and NaH
(C) $P(OH)_3$ and NaH_2PO_4 (D) PH_3 and NaH_2PO_2

Space for your notes:

Q12 - 27 June - Shift 2

The gas produced by treating an aqueous solution of ammonium chloride with sodium nitrite is

(A) NH_3 (B) N_2
(C) N_2O (D) Cl_2

Space for your notes:

Q13 - 27 June - Shift 2

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Flourine forms one oxoacid.

Reason R : Flourine has smallest size amongst all halogens and is highly electronegative

In the light of the above statements, choose the most appropriate answer from the options given below.

(A) Both A and R are correct and R is the correct explanation of A.

(B) Both A and R are correct but R is NOT the correct explanation of A.

(C) A is correct but R is not correct.

(D) A is not correct but R is correct

Space for your notes:

Q14 - 27 June - Shift 2

On the surface of polar stratospheric clouds, hydrolysis of chlorine nitrate gives A and B while its reaction with HCl produces B and C. A, B and C are, respectively

(A) HOCl, HNO_3, Cl_2

(B) Cl_2, HNO_3, HOCl

(C) $HClO_2$, HNO_2, HOCl

(D) HOCl, HNO_2, Cl_2O

Space for your notes:

Q15 - 28 June - Shift 1

Nitrogen gas is obtained by thermal decomposition of

(A) $Ba(NO_3)_2$ (B) $Ba(N_3)_2$

(C) $NaNO_2$ (D) $NaNO_3$

Space for your notes:

Q16 - 28 June - Shift 1

Given below are two statements :

Statement -I :The pentavalent oxide of group- 15 element. E_2O_5. is less acidic than trivalent oxide. E_2O_3. of the same element.

Statement -II :The acidic character of trivalent oxide of group 15 elements. E_2O_3. decreases down the group.

In light of the above statements. choose most appropriate answer from the options given below:

(A) Both Statement I and Statement II are true.

(B) Both Statement I and Statement II are false.

(C) Statement I true. but statement II is false.

(D) Statement I is false but statement II is true.

Space for your notes:

Q17 - 28 June - Shift 2

Among the following basic oxide is :

(A) SO_3 (B) SiO_2

(C) CaO (D) Al_2O_3

Space for your notes:

Q18 - 28 June - Shift 2

Among the given oxides of nitrogen; N_2O, N_2O_3, N_2O_4 and N_2O_5, the number of compound/(s) having N–N bond is :

(A) 1 (B) 2

(C) 3 (D) 4

Space for your notes:

Q19 - 28 June - Shift 2

Which of the following oxoacids of sulphur contains "S" in two different oxidation states?

(A) $H_2S_2O_3$ (B) $H_2S_2O_6$

(C) $H_2S_2O_7$ (D) $H_2S_2O_8$

Space for your notes:

Q20 - 29 June - Shift 1

The oxoacid of phosphorus that is easily obtained from a reaction of alkali and white phosphorus and has two P-H bonds, is :

(A) Phosphonic acid

(B) Phosphinic acid

(C) Pyrophosphorus acid

(D) Hypophosphoric acid

Space for your notes:

Q21 - 29 June - Shift 1

The acid that is believed to be mainly responsible for the damage of Taj Mahal is

(A) Sulfuric acid (B) Hydrofluoric acid

(C) Phosphoric acid (D) Hydrochloric acid

Space for your notes:

Answer Key

Q1 (B) **Q2** (C) **Q3** (B) **Q4** (B)

Q5 (2) **Q6** (C) **Q7** (A) **Q8** (B)

Q9 (B) **Q10** (D) **Q11** (D) **Q12** (B)

Q13 (A) **Q14** (A) **Q15** (B) **Q16** (D)

Q17 (C) **Q18** (C) **Q19** (A) **Q20** (B)

Q21 (A)

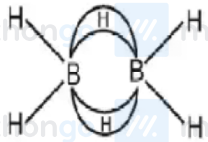
Q1 (B)

Na_2O = Basic As_2O_3 = Amphoteric

N_2O = Neutral NO = Neutral

Cl_2O_7 = Acidic

Q2 (C)



(A) (B)

Two 3 centre – 2 – electron bonds

(C) B_2H_6 is e^- deficient species

(E) B_2H_6 is non – Planar molecule

(D) $BF_3 + LiAlH_4 \rightarrow 2B_2H_6 + 3LiF + 3AlF_3$

$NaBH_4 + I_2 \rightarrow B_2H_6 + 2NaI + H_2$

Q3 (B)

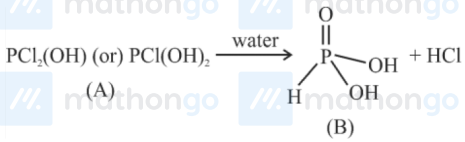
Calcium and phosphate are the major components of teeth enamel

Q4 (B)

PCl_5 forms five bonds by using the d–orbitals to "expand the octet". But NCl_5 does not exist because there are no d–orbitals in the valence shell (2^{nd} shell). Therefore there is no way to expand the octet.

Q5 (2)

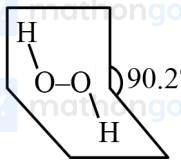
$PCl_3 + H_2O \xrightarrow[\text{hydrolysis}]{\text{Partial}} PCl_2(OH)\ (or)\ PCl(OH)_2 +$ HCl



no. of ionisable protons in B = 2

Q6 (C)

$2HSO_4^-(aq.) \xrightarrow[(2)\ \text{Hydrolysis}]{(1)\ \text{Electrolysis}} 2HSO_4^- + 2H^+ + \underset{(A)}{H_2O_2}$



Solid phase.

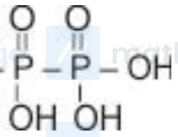
Q7 (A)

Hydride	M.P.
H_2O	273 K
H_2S	188 K
H_2Se	208 K
H_2Te	222 K

Q8 (B)

White P_4 + alkali $\rightarrow$ H_3PO_2

Red P_4 + alkali $\rightarrow$ $H_4P_2O_6$

Structure of $H_4P_2O_6$ = 

No P-H bond

Q9 (B)

Polar stratospheric clouds provide surface on which hydrolysis of $ClONO_2$ takes place to form HOCl (Hypochlorous acid)

$ClONO_2(g) + H_2O(g) \rightarrow HOCl(g) + HNO_3(g)$

Q10 (D)

$(CH_3)_4Si$ is a silane

$(CH_3)Si(OH)_3$ polymerise to form 2D silicone

$(CH_3)_2Si(OH)_2$ polymerise to form chain silicone

$(CH_3)_3Si(OH)$ form dimer $(CH_3)_3Si\text{-}O\text{-}Si(CH_3)_3$

Q11 (D)

$$P_4 + 3NaOH + 3H_2O \rightarrow 3NaH_2PO_2 + PH_3$$

Q12 (B)

$$NH_4Cl + NaNO_2 \rightarrow NH_4NO_2 + NaCl$$

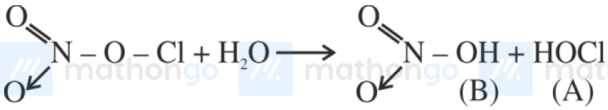
$$\downarrow$$

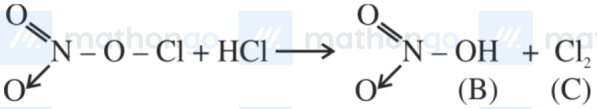
$$N_2 + 2H_2O$$

Q13 (A)

Both A and R are correct and R is the correct explanation of A.

Q14 (A)





Q15 (B)

$$Ba(N_3)_2 \rightarrow Ba + 3N_2$$

Q16 (D)

As +ve oxidation state increases, EN of element increases hence acidic character increases. Down the group, non-metallic character decreases, acidic character decreases.

Acidic character : $E_2O_5 > E_2O_3$

Down the group, acidic character of E_2O_3 decreases

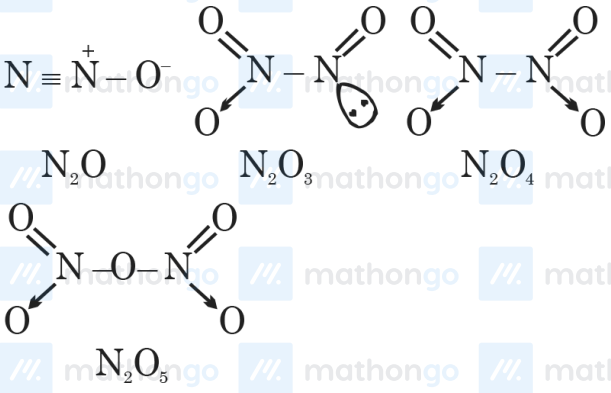
Q17 (C)

$SO_3, SiO_2 =$ Acidic

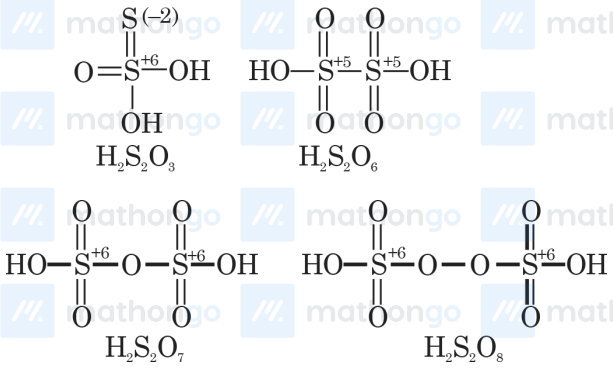
$CaO =$ Basic

$Al_2O_3 =$ Amphoteric

Q18 (C)



Q19 (A)



Q20 (B)

$P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$

oxoacid = H_3PO_2 (hypo phosphorus acid) or (phosphinic acid)

Q21 (A)

$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 + H_2O + CO_2$