Q1 - 2024 (01 Feb Shift 2)

Match List - I with List - II.

List - I Compound	List - II Use
(A) Carbon tetrachloride	(I) Paint remover
(B) Methylene chloride	(II) Refrigerators and air conditioners
(C) DDT	(III) Fire extinguisher
(D) Freons	(IV) Non Biodegradable insecticide

Choose the correct answer from the options given below :

(1) (A)-(I), (B), (II), (C)-(III), (D)-(IV)

(2) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

(3) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

(4) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

Q2 - 2024 (01 Feb Shift 2)

Given below are two statements :

Statement (I) : SiO_2 and GeO_2 are acidic while SnO and PbO are amphoteric in nature.

Statement (II) : Allotropic forms of carbon are due to property of catenation and $p\pi - d\pi$ bond formation.

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

(1) Both Statement I and Statement II are false

(2) Both Statement I and Statement II are true

(3) Statement I is true but Statement II is false

(4) Statement I is false but Statement II is true

Q3 - 2024 (27 Jan Shift 1)

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

Assertion (A) : Melting point of Boron (2453 K) is unusually high in group 13 elements.

Reason (R) : Solid Boron has very strong crystalline lattice.

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

(1) Both (A) and (R) are correct but (R) Is not the correct explanation of (A)

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

(3) (A) is true but (R) is false

(4) (A) is false but (R) is true

Q4 - 2024 (29 Jan Shift 1)

Identify the incorrect pair from the following :

(1) Fluorspar- BF_3

(2) Cryolite- Na_3AlF_6

(3) Fluoroapatite- $3Ca_3(PO_4)_2 \cdot CaF_2$

(4) Carnallite- $KCl \cdot MgCl_2 \cdot 6H_2O$

Q5 - 2024 (31 Jan Shift 1)

Consider the oxides of group 14 elements $SiO_2, GeO_2, SnO_2, PbO_2, CO$ and GeO. The amphoteric oxides are

(1) GeO, GeO_2

(2) SiO_2, GeO_2

(3) SnO_2, PbO_2

(4) SnO_2, CO

Q6 - 2024 (31 Jan Shift 2)

Given below are two statements :

Statement I: Group 13 trivalent halides get easily hydrolyzed by water due to their covalent nature.

Statement II: $AlCl_3$ upon hydrolysis in acidified aqueous solution forms octahedral $\left[Al(H_2O)_6\right]^{3+}$ ion.

In the light of the above statements, choose the correct answer from the options given below :

(1) Statement I is true but statement II is false

(2) Statement I is false but statement II is true

(3) Both statement I and statement II are false

(4) Both statement I and statement II are true

Answer Key

Q1 (2) **Q2** (3) **Q3** (2) **Q4** (1)

Q5 (3) **Q6** (4)

Q1

CCl_4 used in fire extinguisher. CH_2Cl_2 used as paint remover. Freons used in refrigerator and AC. DDT used as non Biodegradable insecticide.

Q2

SiO_2 and GeO_2 are acidic and SnO, PbO are amphoteric.

Carbon does not have d-orbitals so can not form $p\pi - d\pi$ Bond with itself. Due to properties of catenation and $p\pi - p\pi$ bond formation. carbon is able to show allotropic forms.

Q3

Solid Boron has very strong crystalline lattice so its melting point unusually high in group 13 elements

Q4

Fluorspar is CaF_2

Q5

SnO_2 and PbO_2 are amphoteric

Q6

In trivalent state most of the compounds being covalent are hydrolysed in water. Trichlorides on hydrolysis in water form tetrahedral $[M(OH)_4]^-$ species, the hybridisation state of element M is sp^3.

In case of aluminium, acidified aqueous solution forms octahedral $\left[Al(H_2O)_6\right]^{3+}$ ion.