

p- block and d & f-Block elements

1. Given below are two statements :

Statement I :

α and β forms of sulphur can change reversibly between themselves with slow heating or slow cooling.

Statement II :

At room temperature the stable crystalline form of sulphur is monoclinic sulphur.

In the light of the above statements, choose the correct 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 is true but Statement II is false.
 - D. Statement I is false but Statement II is true.
2. The correct order of electron gain enthalpy is :
- A. $O > S > Se > Te$
 - B. $Te > Se > S > O$
 - C. $S > O > Se > Te$
 - D. $S > Se > Te > O$

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3. Match List - I with List -II

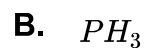
<i>List – I</i>	<i>List – II</i>
Name of oxo acid	Oxidation state of 'P'
(a) Hypophosphorous acid	(i) + 5
(b) Orthophosphoric acid	(ii) + 4
(c) Hypophosphoric acid	(iii) + 3
(d) Orthophosphorous acid	(iv) + 2
	(v) + 1

Choose the correct answer from the options given below :

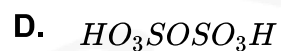
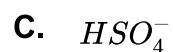
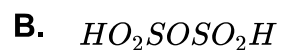
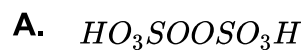
- A.** (a) -(iv), (b)-(v), (c)-(ii), (d)-(iii)
- B.** (a) -(v), (b)-(iv), (c)-(ii), (d)-(iii)
- C.** (a) -(v), (b)-(i), (c)-(ii), (d)-(iii)
- D.** (a) -(iv), (b)-(v), (c)-(ii), (d)-(iii)
4. A group 15 element which is a metal and forms a hydride with strongest reducing power among group 15 hydrides. The element is
- A.** *As*
- B.** *P*
- C.** *Bi*
- D.** *Sb*
5. Which of the following compound CANNOT act as a lewis base ?
- A.** NF_3
- B.** PCl_5
- C.** ClF_3
- D.** SF_4

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6. Which one of the following group-5 hydride is the strongest reducing agent?



7. The product obtained from electrolytic oxidation of acidified sulphate solutions, is



8. Number of $Cl = O$ bonds chlorous acid, chloric acid and perchloric acid respectively are

A. 1, 2 and 3

B. 4, 1 and 0

C. 1, 1 and 3

D. 3, 1 and 1

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9. White phosphorus on reaction with concentrated $NaOH$ solution in an inert atmosphere of CO_2 gives phosphine and compound (X). (X) on acidification with HCl gives compound (Y). The basicity of compound (Y) is
- A. 3
 - B. 2
 - C. 4
 - D. 1
10. Reaction of ammonia with excess Cl_2 gives
- A. NH_4Cl and HCl
 - B. NCl_3 and HCl
 - C. NCl_3 and NH_4Cl
 - D. NH_4Cl and N_2
11. Chemical nature of the nitrogen oxide compound obtained from a reaction of concentrated nitric acid and P_4O_{10} (in 4 : 1 ratio) is :
- A. acidic
 - B. basic
 - C. neutral
 - D. amphoteric

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12. What is the correct order of the following elements with respect to their density ?

- A. $Cr < Zn < Co < Cu < Fe$
- B. $Cr < Fe < Co < Cu < Zn$
- C. $Zn < Cu < Co < Fe < Cr$
- D. $Zn < Cr < Fe < Co < Cu$

13. Given below are two statements :

Statement - I : CeO_2 can be used for oxidation of aldehyde and ketones.

Statement - II : Aqueous solution of $EuSO_4$ is a strong reducing agent.

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

- A. Both Statement I and Statement II are false
- B. Both Statement I and Statement II are true
- C. Statement I is true but Statement II is false
- D. Statement I is false but Statement II is true

14. Fe_x and Fe_y are known when x and y are

- A. $x = F, Cl, Br, I$ and $y = F, Cl, Br$
- B. $x = Cl, Br, I$ and $y = F, Cl, Br, I$
- C. $x = F, Cl, Br$ and $y = F, Cl, Br, I$
- D. $x = F, Cl, Br, I$ and $y = F, Cl, Br, I$

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15. What is the spin-only magnetic moment value ($B. M$) of a divalent metal ion with atomic number 25, in its aqueous solution ?

- A. 5.92
- B. 5.26
- C. Zero
- D. 5.0

16. Given below are two statements :

Statement I: Potassium permanganate on heating at 573 K forms potassium manganate.

Statement II : Both potassium permanganate and potassium manganate are tetrahedral and paramagnetic in nature.

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

- A. Statement I is false but statement II is true
- B. Both statement I and statement II are false
- C. Both statement I and statement II are true
- D. Statement I is true but statement II is false

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17. The correct order of following 3d metal oxides, according to their oxidation number is

- (a) CrO_3
- (b) Fe_2O_3
- (c) MnO_2
- (d) V_2O_5
- (e) Cu_2O

- A.** (a) > (d) > (c) > (b) > (e)
- B.** (d) > (a) > (b) > (c) > (e)
- C.** (a) > (c) > (d) > (b) > (e)
- D.** (c) > (a) > (d) > (e) > (b)

18. The spin only magnetic moments (in BM) for free Ti^{3+} , V^{2+} and Sc^{3+} ions respectively are

(At. No – Sc : 21, Ti : 22, V : 23)

- A.** 1.73, 3.87, 0
- B.** 0, 3.87, 1.73
- C.** 3.87, 1.73, 0
- D.** 1.73, 0, 3.87

19. Which one of the following lanthanides exhibits +2 oxidation state with diamagnetic nature ? (Given Z for Nd = 60, Yb = 70, La = 57, Ce = 58)

- A.** Nd
- B.** Yb
- C.** La
- D.** Ce

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20. Identify the element for which electronic configuration in +3 oxidation state is $[Ar]3d^5$:
- A. Mn
 - B. Ru
 - C. Co
 - D. Fe
21. Among the following allotropic forms of sulphur, the number of allotropic forms, which will show paramagnetism is _____
- (A) α – sulphur
 - (B) β – sulphur
 - (C) S_2 – form
22. Among the following, the number of halide(s) which is/are inert to hydrolysis is/are
- (A) BF_3
 - (B) $SiCl_4$
 - (C) PCl_5
 - (D) SF_6
23. The reaction of white phosphorus on boiling with alkali in inert atmosphere resulted in the formation of product 'A'. The reaction of 1 mol of 'A' with excess of $AgNO_3$ in aqueous medium gives _____ mol(s) of Ag
- (Round off the Nearest integer).
24. The number of halogen(s) forming halic (V) acid is/are
25. The spin only magnetic moment of a divalent ion in aqueous solution (atomic number 29) is (nearest integer)
26. In mildly alkaline medium, thiosulphate ion is oxidized by MnO_4^- to "A". The oxidation state of sulphur in "A" is

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27. In the ground state of atomic $Fe (Z = 26)$, the spin-only magnetic moment is $x \times 10^{-1} BM$.
(Round off to the Nearest Integer).
28. Number of electrons present in 4f-orbital of Ho^{3+} ion is _____.
(Given: Atomic no. of $Ho = 67$)
29. The number of 4f electrons in the ground state electronic configuration of Gd^{2+} is _____.
[Atomic number of Gd = 64]
30. The number of 'f' electrons in the ground state electronic configuration of $Np (Z = 93)$ is _____.