p- block and d & f-Block elements

1. Given below are two statements :
   Statement I :
   $\alpha \; and \; \beta$ 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. $S > Se > Te > O$

3. Match List - I with List -II

$List - I$	$List - II$
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

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

   A. AsH_3

   B. PH_3

   C. SbH_3

   D. BiH_3

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

   A. HO_3SOOSO_3H

   B. HO_2SOSO_2H

   C. HSO_4^-

   D. HO_3SOSO_3H

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

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

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. Fex_2 and Fey_3 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 $y = F, Cl, Br, I$

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

A. 5.92

B. 5.26

C. Zero

D. 5.0

16. Given below are two statements :
Statements 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

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. $(\mathrm{a}) > (\mathrm{d}) > (\mathrm{c}) > (\mathrm{b}) > (\mathrm{e})$

B. $(\mathrm{d}) > (\mathrm{a}) > (\mathrm{b}) > (\mathrm{c}) > (\mathrm{e})$

C. $(\mathrm{a}) > (\mathrm{c}) > (\mathrm{d}) > (\mathrm{b}) > (\mathrm{e})$

D. $(\mathrm{c}) > (\mathrm{a}) > (\mathrm{d}) > (\mathrm{e}) > (\mathrm{b})$

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

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 _____

$(A)\ \alpha - sulphur$
$(B)\ \beta - sulphur$
$(C)\ S_2 - form$

22. Among the following, the number of halide(s) which is/are inert to hydrolysis is/are

$(A)\ BF_3$
$(B)\ SiCl_4$
$(C)\ PCI_5$
$(D)\ SF_6$

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

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 _____.