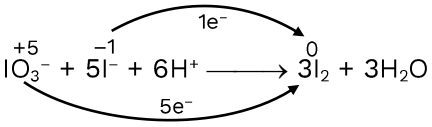
CHEMISTRY

1. $2IO_3^- + xI \longrightarrow 6I_2 + 12H_2O$

(1) 6 (2) 2 (3) 10 (4) 12

Ans. (3)

Sol.



On multiply by 2

$2IO_3- + 10I^- + 12H^+ \longrightarrow 6I_2 + 6H_2O$

2. $[Mn(Br)_4]^{-2}$, $[Co(Cl)_6]^{-3}$, $[FeCl_6]^{3-}$

Correct order of magnetic moment

(1) $[Co(Cl)_6]^{-3} < [Mn(Br)_4]^{-2} \simeq [FeCl_6]^{3-}$ (2) $[Mn(Br)_4]^{-2} > [Co(Cl)_6]^{-3} < [FeCl_6]^{3-}$

(3) $[Mn(Br)_4]^{-2} < [Co(Cl)_6]^{-3} < [FeCl_6]^{3-}$ (4) $[Mn(Br)_4]^{-2} > [Co(Cl)_6]^{-3} > [FeCl_6]^{3-}$

Ans. (1)

Sol.

$[MnBr_4]^{2-}$	No. of unpaired e^-
Mn^{2+} : [Ar] $3d^4 4s^0 4p^0$	5
$[CoCl_6]^{3-}$	
CO^{3+} = [Ar] $3d^6 4s^0 4p^0$	4
$[FeCl_6]^{3-}$	
Fe^{3+} = [Ar] $3d^5 4s^0 4p^0$	5

3. Electronegativity order of following element P, C At, Br

(1) Br > C > At > P (2) C > Br > P > At (3) P > At > C > Br (4) P > C > At > Br

Ans. **(1)**

Sol.

	C	N	O	F
Electro Negativity	2.5	P		Cl
	2.1			Br
				2.8
				I
				At
				2.2

4. Match the column

List I	**List II**
(A) Alitame	(P) Stable at cooking temperature
(B) Aspartame	(Q) Unstable at cooking temperature
(C) Sucralose	(R) Most sweet
(D) Saccharin	(S) First artificial sugar

(1) (A)-R; (B)-Q; (C)-P; (D)-S (2) (A)-Q; (B)-P; (C)-S; (D)-R

(3) (A)-P; (B)-Q; (C)-R; (D)-S (4) (A)-S; (B)-R; (C)-P; (D)-Q

Ans. (1)

Sol.

5. How many factors will contribute to covalent character of a compound

(a) Polarising power of cation (b) Polarisibility of anion

(c) Polarisibility of cation (d) distortion caused by cation

Ans. (03.00)

Sol.

6. $XeF_2 + SbF_5 \rightarrow [XeF_m]^{+n}[SbF_p]^{q-}$

The value of m + n + p + q

Ans. (11)

Sol. $XeF_4 + SbF_5 \rightarrow [XeF_3]^{\oplus}[SbF_6]^{\ominus}$

m = 3 p = 6

n = +1 q = 1

m + n + p + q = 11

7. Sulphur is present in how many of following amino acids

Leucine, isoleucine, cystine, Methionine, threonine

Ans. (02.00)

8. Match the column

Concentration in drinking water

	List-I		**List-II**
(A)	F^-	(P)	<5 ppm
(B)	NO_3^-	(Q)	<50 ppm
(C)	SO_4^{2-}	(R)	<500 ppm
(D)	Zn	(S)	< 2 ppm

(1) (A)-S, (B)-Q, (C)-R, (D)-P (2) (A)-P, (B)-Q, (C)-R, (D)-S

(3)(A)-Q, (B)-S, (C)-R, (D)-P (4) (A)-R, (B)-Q, (C)-S, (D)-P

Ans. **(1)**

Sol.

9. Which metal can be extracted by leaching using alkali cyanide:

(1) Cu (2) Pb (3) Au (4) Sn

Ans. (3)

Sol.

10. When water gas react with CO in the presence of catalyst

the product is?

(1) $CO_2 + H_2$ (2) $CO_2 + H_2$ (3) $CO_2 + H_2O$ (4) None of these

Ans. (1)

Sol. Coal gasification

$C + H_2O(g) \xrightarrow{\Delta} CO + CO_2$

Water gas shift R × n

$CO + H_2O(g) \xrightarrow{\text{Catalyst}} CO_2(g) = H_2$

11. in CrO_2Cl_2 oxidation number of Cr is same as

(1) Mn(VI) (2) Ti (III) (3) V (IV) (4) Fe (III)

Ans. (1)

Sol.

12. Consider the reaction:

$Cu^{2+} + X^- \longrightarrow Cu_2X_2 + X_2$

Find product X_2 will be predominantly:

(1) Cl_2 (2) Br_2 (3) I_2 (4) All halogens are possible

Ans. (3)

Sol. $\overset{+2}{Cu}^{2+} + \overset{-1}{I^-} \longrightarrow \overset{+1}{Cu_2}\,\overset{-1}{I_2} + \overset{0}{I_2}$

13. Read the following two statements

Statement I: Ionic radius of Li^+ is greater than Mg^{2+}

Statement II: Lithium and magnesium can't form superoxide

(1) statement I and statement II are correct

(2) statement I and statement II are incorrect

(3) Statement I is correct but statement II is incorrect

(4) Statement I is incorrect but statement II is correct

Ans. (1)

Sol.

14. Mass of the proton is 6×10^{-24} g and mass of electron is 9.1×10^{-28} g.

If the are having same wavelength find the ratio of their momentum

(1) $\frac{1}{1}$ (2) $\frac{1}{2}$ (3) $\frac{1}{4}$ (4) $\frac{2}{1}$

Ans. (1)

Sol. $\lambda = \frac{h}{p} \Rightarrow P = \frac{h}{\lambda}$

$= P_1 : P_2$

$= 1 : 1$

15. Why gypsum is added to cement.

Sol. Theory based

16. Hydrocarbon X on ozonolysis give propanone (acetone) and ethanal. find the molecular weight of compound X?

Ans. (70.00)

Sol. $H_3C-\overset{\overset{CH_3}{|}}{C}=CH-CH_3 \xrightarrow{O_3} CH_3-\overset{\overset{O}{\|}}{C}-CH_3 + CH_3-CHO$

17. 0.5 gm organic compound with 60% carbon gives $x \times 10^{-1}$ gm of CO_2 on complete combustion

Ans. (11.00)

Sol. $W_c = \frac{0.5 \times 60}{100} = 0.3$

$CO_2 \longrightarrow C \quad \frac{44}{12} = \frac{x}{0.3}$

$x = \frac{11}{10}$ g.

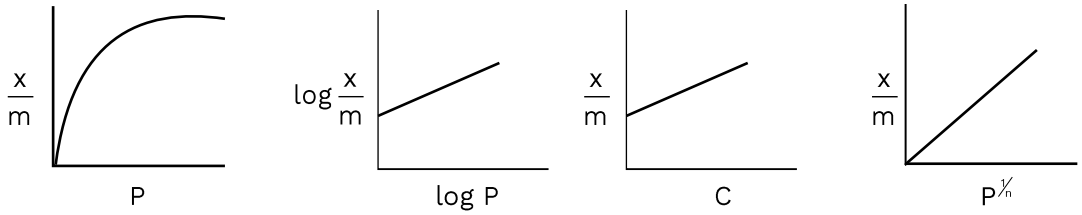
18. Which of the following is most stable, diamagnetic and octahedral in Nature?

(1) $[Co(CN)_6]^{3-}$ (2) $[Co(Cl)_6]^{3-}$ (3) $[Co(H_2O)_6]^{2+}$ (4) $[Ni(NH_3)_6]^{+2}$

Ans. (1)

Sol.

19. How many of the following graphs show correct representation of freundlich adsorption isotherm ?



Ans. (02.00)

Sol. Freundlich adsorption isotherm equation

$$\frac{x}{m} = RP^{1/n}$$

20. **Statement I:**If heat is given to a system the temp always increases
Statement II: If work done by system is positive, volume always increases
(1) statement I and statement II are correct
(2) statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

Ans. (4)

Sol.

21. **Assertion:** butanol has highest boiling point than ethoxyethane.
Reason: because of more hydrogen bonding.
(1) Both A and R are true and R is the correct explanation of A
(2) Both A and R are true but R is NOT the correct explanation of A
(3) A is true but R is false
(4) A is false but R is true

Ans. (1)

Sol.

22. Which cell representation is correct for the reaction give below:

$H_2 + 2AgCl \longrightarrow 2H^+ + 2Ag + 2Cl^-$

(1) Pt $|H_2|HCl|AgCl|$ Ag| Pt
(2) Pt $|H_2|HCl|AgCl|$ Pt
(3) Ag $|AgCl|HCl|H_2|$ Pt
(4) Pt $|AgCl|HCl|H_2|$ Pt

Ans. **(1)**

23. How many statements are correct:
(a) If there is no relation between rate constant and temperature, then activation energy is negative
(b) If the activation energy is zero, rate constant is temperature independent
(c) If rate constant increases with increase of temperature, activation energy is positive
(d) If rate constant decreases with increase in temperature, activation energy is negative

Ans. **(02.00)**

Sol.

24. Cu as catalyst with Syn gas produces :D
(1) Ethanol (2) Methanol (3) Methane (4) Methanonic acid

Ans. **(2)**

25. How many of the following reagents are used to react with diazonium to got product given against

(a) HBF_4 — Ph-F

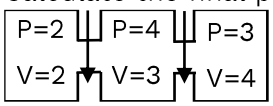
(b) CUCN — Ph-CN

(c) $CuCl_2$ — Ph-Cl

(d) Ph NH_2 — Ph–N=N-Ph

Ans. **(02.00)**

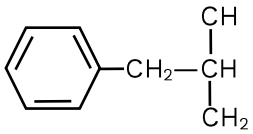
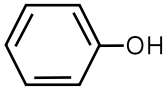
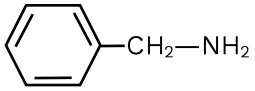
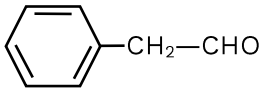
26. Calculate the final pressure when valves are released



Ans. **(03.00)**

Sol.

27. **Match the column**

Column I	**Column II**
(A) Neutral $FeCL_3$	(P) 
(B) Iodoform	(Q) 
(C) Carbylamine test	(R) 
(F) $CuSO_4$ + sodium potassium tartarate (Rochecle's salt)	(S) 

(1) (A)-Q; (B)-R; (C)-P; (D)-S

(2) (A)-P; (B)-R; (C)-Q; (D)-S

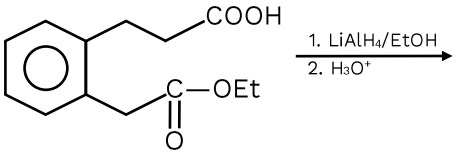
(3) (A)-Q; (B)-P; (C)-R; (D)-S

(4) (A)-Q; (B)-P; (C)-S; (D)-R

Ans. (3)

Sol.

28. Find the major product?



Sol.