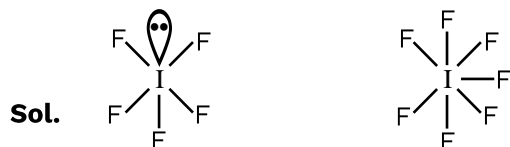




CHEMISTRY

1. Sum of number of lone pair in central atom IF_5 and IF_7

Ans. 01.00



2. Which is diamagnetic in nature

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

3. Number of bent shape molecule O_3 , SO_2 , I_3^- , N_3^- , NO_2^-

Ans. 3

Sol. O_3 , SO_2 , NO_2^-

4. Match the following list

List I

- (A) Steel
(B) Thermal power plant
(C) Fertilizers industries
(D) Paper mills

List II

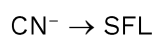
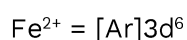
- (P) Gypsum
(Q) Slag
(R) Flyash
(S) Biodegradable wastes

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

5. How many unpaired electron in potassium ferrocyanide

Ans. 0

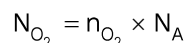
Sol. $K_4[Fe(CN)_6]$



no. of unpaired $e^- = 0$

6. No. of molecules and moles in 2.8375 litres of O_2 at STP is

Sol. $n_{O_2} = \frac{2.8375}{22.4} = 0.125$ mole



$= 0.125 \times 6.02 \times 10^{23}$

7. The compound which does not exist

- (1) $BeCl_2$ (2) NaO_2 (3) $PbEt_4$ (4) $(NH_4)_2BeF_4$

Ans. (2)

8. If final volume is $\frac{1}{8}^{th}$ of initial volume for an ideal gas then find ratio of initial and final pressure.

Ans. 08.00





Sol. $P_1V_1 = P_2V_2$

$$\frac{P_2}{P_1} = \frac{V_1}{V_2} = \frac{V}{V/8} = 8$$

9. One which does not stabilise secondary & tertiary protein?

- (1) H—H linkage (2) S—S linkage
(3) Van-derwaal's force (4) Hydrogen bonding

Ans. (1)

10. Which of the following Stabilizer is used for concentrating sulphide ore:

- (1) Fatty acids (2) Pine oil (3) Cresol (4) Xanthates

Ans. (3)

11. De-broglie wavelength of gas at $T = 300$ K is λ , find the De-broglie wavelength of its molecule at $T = 600$ K.

Ans. $\frac{\lambda}{\sqrt{2}}$

Sol. $\lambda \propto \frac{1}{\sqrt{T}}$

$$\frac{\lambda_1}{\lambda_2} = \sqrt{\frac{T_2}{T_1}} = \sqrt{2}$$

$$\lambda_2 = \frac{\lambda_1}{\sqrt{2}} \Rightarrow \frac{\lambda}{\sqrt{2}}$$

12. Enthalpy of adsorption and enthalpy of formation of micelle are respectively

- (1) Positive, Positive (2) Positive, Negative
(3) Negative, Positive (4) Negative, Negative

Ans. (3)

13. The pressure value of a gas is 930.2 mm Hg. The volume is then reduced to 40% of its initial value at a constant temperature. Then what is the final pressure (in mm Hg)

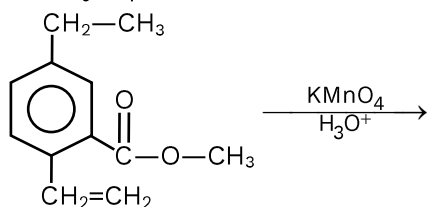
Ans. 2325.5

Sol. $P_1V_1 = P_2V_2$

$$P_2 = P_1 \times \frac{V_1}{V_2} = 930.2 \times \frac{V}{0.4V}$$

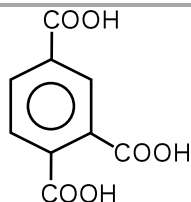
$$\approx 2325.5 \text{ mm}$$

14. Find the major product

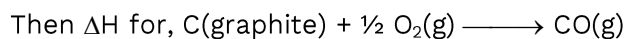
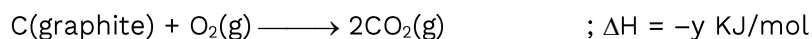




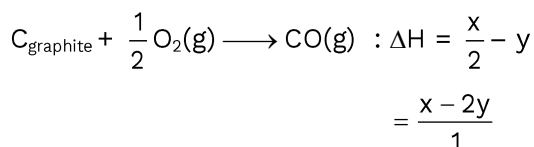
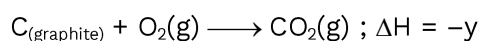
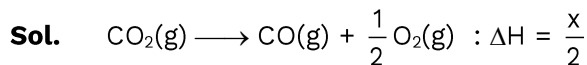
Ans.



15. Select the correct option:



- (1) $x + \frac{y}{2}$ (2) $\frac{x-2y}{2}$ (3) $\frac{x+2y}{2}$ (4) $\frac{x-y}{2}$



16. Prolongated heating ferrous ammonium sulphate is avoided to prevent:

- (1) Oxidation (2) Reduction (3) Hydrolysis (4) Breaking

Ans. (1)

17. Read the following two statements.

Statement I: Potassium dichromate is used in volumetric analysis

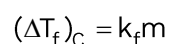
Statement II: $\text{K}_2\text{Cr}_2\text{O}_7$ is more soluble in water than $\text{Na}_2\text{Cr}_2\text{O}_7$

- (1) Both statements I and II are correct
 (2) Both statements I and II are incorrect
 (3) Statement I is correct and II is incorrect
 (4) Statement I is incorrect and II is correct

Ans. (3)

18. The degree dissociation of monobasic acid is 0.3. By what percent is the observed depression in freezing point greater than the calculated depression in freezing point?

Ans. 30.00



$$\frac{(\Delta T_f)_O}{(\Delta T_f)_C} \times 100 = (i - 1) \times 100$$



1

$1-\alpha$ α α





$$\begin{aligned} I &= 1 + \alpha \\ &= (1 + \alpha - 1) \times 100 \\ &= 0.30 \times 100 \\ &= 30\% \end{aligned}$$

19. Compute the angular momentum in second orbit, if L is the angular momentum of He electron in the first orbit of hydrogen atom.

Ans. 2L

Sol. $(mvr) = \frac{nh}{2\pi}$

$$\frac{(mvr)_1}{(mvr)_2} = \frac{n_1}{n_2}$$
$$(mvr)_2 = 2L$$

20. Match the column

Column-I

- (A) Monoatomic
- (B) Diatomic
- (C) Triatomic linear
- (D) Triatomic non linear

Column-II

Degree of freedom

- (P) $F_T = 3, F_R = 2, F_V = 1$
- (Q) $F_T = 3, F_R = 0, F_V = 0$
- (R) $F_T = 3, F_R = 3, F_V = 3$
- (S) $F_T = 3, F_R = 2, F_V = 4$

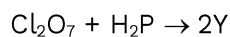
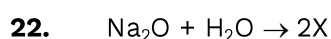
Ans. (A)- Q, (B) -P, (C) - S, (D) - R

21. Correct order of bond dissociation energy order

HF, HCl, HBr, HI

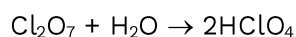
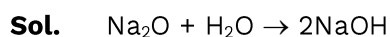
- (1) HF > HCl > HBr > HI
- (2) HCl > HF > HBr > HI
- (3) HCl < HF < HBr < HI
- (4) HCl = HF = HBr ≠ HI

Ans. (1)



Then find the sum of number of oxygen atom in X & Y

Ans. 05.00



no. of oxygen atoms = 1 + 4 = 5

23. Which of the following is Nessler's Reagent

- (1) K_2HgI_4
- (2) K_2HgI_2
- (3) K_2HgI
- (4) None

Ans. (1)





24. Match the following list

Column-I

- (A) Nylon-2, Nylon-6
- (B) Urea formaldehyde resin
- (C) Dacron
- (D) Nylon-6,6

Column-II

- (P) Thermosetting
- (Q) Polyester
- (R) Biodegradable
- (S) Used for making bristles of brushes

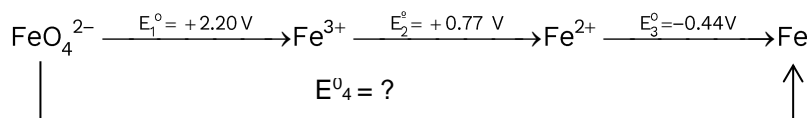
- (1) (A)- R, (B) -P, (C) - Q, (D) - S
- (2) (A)- S, (B) -R, (C) - P, (D) -Q
- (3) (A)- Q, (B) -P, (C) - S, (D) - R
- (4) (A)- R, (B) -S, (C) - P, (D) - Q

Ans. (1)

25. The pair of compound from the following pairs having both the compounds with net zero dipole moment is

- (1) CH₂Cl₂; CHCl₃
- (2) Benzene ; P-Anisidine
- (3) 1,4-chlorobenzene; 1, 3,5-trichlorobenzne
- (4) Cis-dichloroethene ; Trans-dichloroethene

Ans. (3)



26.

Value of E_4^0 is close to

- (1) 1.00 V (2) 2.00 V
- (2) (3) 2.50 V (4) 0.50 V

Ans. (2)

Sol. $E_4^0 = \frac{3 \times 2.2 + 1 \times 0.77}{(3 + 1)} = 1.84$

27. Mixture of A and B is added to column containing adsorbent for separation using a solvent. A is eluted first and B is eluted last. Then B has:

- (1) High R_f, less adsorption
- (2) Low R_f, strongly adsorbed
- (3) High R_f, strong adsorption
- (4) Low R_f, weakly adsorbed

Ans. (2)

28. Statement I: Reduction potential M^{3+}/M^{2+} is more for Fe than Mn

Statement II: V^{2+} has magnetic moment between 4.4-5.2 BM.

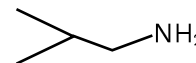
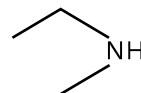
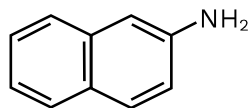
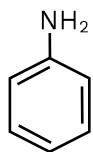
- (1) Both Statement I and statement II are correct.
- (2) Both Statement I and statement II are incorrect.
- (3) Statement I is correct but statement II is incorrect.
- (4) Statement I is incorrect but statement II is correct.





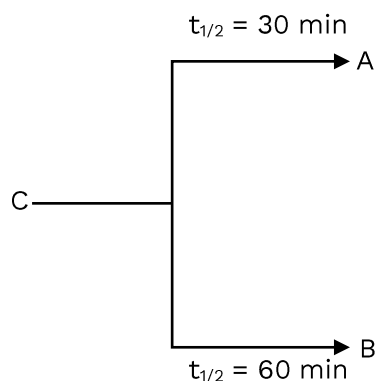
Ans. (2)

29. How many compounds can be easily prepared by Gabriel phthalimide synthesis, which on reaction with Hinsberg reagent produces a compound which is soluble in KOH.



Ans. 02.00

30. For the first order reaction consider the following reaction calculate the overall half life of C in minute.



Ans. 20.00

Sol. For half life of C

$$\frac{1}{t_{C_{1/2}}} = \frac{1}{t_{A_{1/2}}} + \frac{1}{t_{B_{1/2}}}$$

$$\frac{1}{t_{C_{1/2}}} = \frac{1}{30} + \frac{1}{60}$$

$$\frac{1}{t_{C_{1/2}}} = \frac{2+1}{60}$$

$$t_{C_{1/2}} = 20 \text{ min}$$

