JEE (Main) CHEMISTRY SOLVED PAPER

2023
11th April Shift 2

Section A

1. The magnetic moment is measured in Bohr Magneton (BM). Spin only magnetic moment of Fe in $[Fe(H_2O)_6]^{3+}$ and $[Fe(CN)_6]^{3-}$ complexes respectively is:

(1) 3.87 B. M. and 1.732 B.M.
(2) 6.92 B.M. in both
(3) 5.92 B.M. and 1.732 B.M.
(4) 4.89 B.M. and 6.92 B.M.

2. Which one of the following pairs is an example of polar molecular solids?

(1) $SO_2(s), CO_2(s)$ **(2)** $SO_2(s), NH_2(s)$
(3) $MgO(s), SO_2(s)$ **(4)** $HCl(s), AlN(s)$

3. Match List I with List II

List I Complex	List II Colour
(A) $Mg(NH_4)PO_4$	I. Brown
(B) $K_3[Co(NO_2)_6]$	II. White
(C) $MnO(OH)_2$	III. Yellow
(D) $Fe_4[Fe(CN)_6]_3$	IV. blue

Choose the correct answer from the options given below:

(1) A–II, B–III, C–IV, D–I **(2)** A–II, B–IV, C–I, D–III
(3) A–III, B–IV, C–II, D–I **(4)** A–II, B–III, C–I, D–IV

4. A solution is prepared by adding 2 g of "X" to 1 mole of water. Mass percent of "X" in the solution is

(1) 5% **(2)** 20 % **(3)** 2 % **(4)** 10%

5. If Ni^{2+} is replaced by Pt^{2+} in the complex $[NiCl_2Br_2]^{2-}$, which of the following properties are expected to get changed?

A Geometry
B Geometrical isomerism
C Optical isomerism
D Magnetic properties

(1) A, B and C **(2)** A and D
(3) B and C **(4)** A, B and D

6. Given below are two statements:

Statement I: In the metallurgy process, sulphide ore is converted to oxide before reduction.

Statement II: Oxide ores in general are easier to reduce.

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 correct
(2) Statement I is correct but Statement II is incorrect
(3) Statement I is incorrect but Statement II is correct
(4) Both Statement I and Statement II are incorrect

7.

$$H_3C-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3 \xrightarrow[\text{(iii) } D_2O]{\text{(i) NaI, } H_3PO_4 \text{ (ii) Mg, Dry ether}} \underset{\text{Product}}{[X]}$$

Product [X] formed in the above reaction is:

(1) $H_3C-CH_2-\underset{\displaystyle D}{\underset{|}{CH}}-CH_3$

(2) $H_3C-CH_2-CH=CH_2$

(3) $H_3C-CH=CH-CH_3$

(4) $H_3C-CH_2-\overset{\displaystyle H}{\overset{|}{\underset{\displaystyle OH}{\underset{|}{C}}}}-CH_3$

8. Given below are two statements:

Statement I: Ethene at 333 to 343 K and 6-7 atm pressure in the presence of $Al(Et)_3$ and $TiCl_4$ undergoes addition polymerization to give LDP.

Statement II: Caprolactam at 533-543 K in H_2O through step growth polymerizes to give Nylon 6.

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) Both Statement I and Statement II are true
(3) Statement I is false but Statement II is true
(4) Both Statement I and Statement II are false

9. For a chemical reaction A + B $\rightarrow$ Product, the order is 1 with respect to A and B.

Rate Mol L^{-1} S^{-1}	[A] Mol L^{-1}	[B] Mol L^{-1}
0.10	20	0.5
0.40	X	0.5
0.80	40	Y

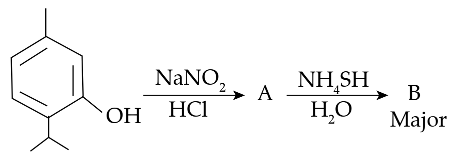
What is the value of x and y?

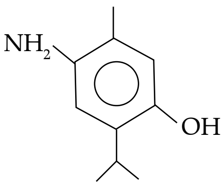
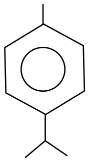
(1) 80 and 2 **(2)** 40 and 4
(3) 80 and 4 **(4)** 160 and 4

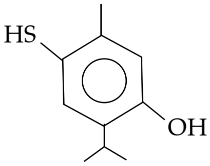
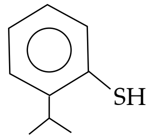
10. Which of the following compounds is an example of Freon?

(1) C_2F_4 **(2)** C_2HF_3 **(3)** CF_2Cl_2 **(4)** $C_2H_2F_2$

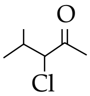
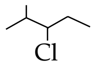
11. Compound 'B' is



(1)  (2) 

(3)  (4) 

12. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A:  can be subjected to Wolff-Kishner reduction to give 

Reason R: Wolff–Kishner reduction is used to convert $\overset{O}{\overset{\|}{\diagup C \diagdown}}$ into $\diagup CH_2 \diagdown$

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

(1) Both A and R are true and R is the correct explanation of A
(2) A is true but R is false
(3) Both A and R are true but R is NOT the correct explanation of A
(4) A is false but R is true

13. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

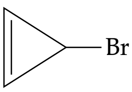
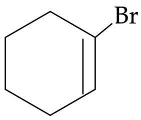
Assertion A: $[CoCl(NH_3)_5]^{2+}$ absorbs at lower wavelength of light with respect to $[CoCl(NH_3)_5(H_2O)]^{3+}$

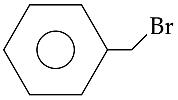
Reason R: It is because the wavelength of the light absorbed depends on the oxidation state of the metal ion.

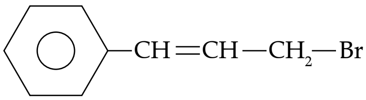
In the light of the above statements, choose the correct answer from the options given below:

(1) Both A and R are true but R is NOT the correct explanation of A
(2) A is true but R is false
(3) Both A and R are true and R is the correct explanation of A
(4) A is false but R is true

14. Compound from the following that will not produce precipitate on reaction with $AgNO_3$ is

(1)  (2) 

(3) 

(4) 

15. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: A solution of the product obtained by heating a mole of glycine with a mole of chlorine in presence of red phosphorous generates chiral carbon atom.

Reason R: A molecule with 2 chiral carbons is always optically active.

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

(1) A is false but R is true
(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) Both A and R are true and R is the correct explanation of A

16. Alkali metal from the following with least melting point is:

(1) K **(2)** Cs **(3)** Rb **(4)** Na

17. Which hydride among the following is less stable?

(1) HF **(2)** NH_3 **(3)** BeH_2 **(4)** LiH

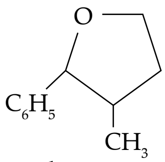
18. The major product formed in the following reaction is

$$C_6H_5-CH(OH)-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2CHO \xrightarrow[\Delta]{Zn(Hg)/HCl} \text{Major products}$$

(A) $C_6H_5-CH(OH)-\underset{\displaystyle CH_3}{\underset{|}{CH}}-C_2H_5$

(B) $C_6H_5-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-C_2H_5$

(C) $C_6H_5-\underset{\displaystyle CH_3}{\underset{|}{C}}=CH-C_2H_5$

(D) 

Choose the correct answer from the options given below:

(1) C only **(2)** A only **(3)** B only **(4)** D only

19. One mole of P_4 reacts with 8 moles $SOCl_2$ to give 4 moles of A, x mole of SO_2 and 2 moles of B. A, B and *x* respectively are

(1) $POCl_3$, S_2Cl_2 and 4 **(2)** $POCl_3$, S_2Cl_2 and 2
(3) PCl_3, S_2Cl_2 and 4 **(4)** PCl_3, S_2Cl_2 and 2

20. What weight of glucose must be dissolved in 100 g of water to lower the vapour pressure by 0.20 mmHg?
(Assume dilute solution is being formed)
Given: Vapour pressure of pure water is 54.2 mmHg at room temperature. Molar mass of glucose is 180 g mol^{-1}

(1) 2.59 g **(2)** 3.59 g **(3)** 3.69 g **(4)** 4.69 g

Section B

21. The total number of intensive properties from the following is_______ new line volume, molar heat capacity, Molarity, $E^{\ominus}$ cell, Gibbs free energy change, Molar mass, Mole

22. The volume of hydrogen liberated at STP by treating 2.4 g of magnesium with excess of hydrochloric acid is __________$\times 10^{-2}$L

Given: Molar volume of gas is 22.4 L at STP. Molar mass of magnesium is 24 g mol^{-1}

23. The number of correct statements about modern adsorption theory of heterogeneous catalysis from the following is

(A) The catalyst is diffused over the surface of reactants.

(B) Reactants are adsorbed on the surface of the catalyst.

(C) Occurrence of chemical reaction on the catalyst's surface through formation of an intermediate.

(D) It is a combination of intermediate compound formation theory and the old adsorption theory.

(E) It explains the action of the catalyst as well as those of catalytic promoters and poisons.

24. The number of correct statements from the following is

(A) For 1s orbital, the probability density is maximum at the nucleus

(B) For 2s orbital, the probability density first increases to maximum and then decreases sharply to zero.

(C) Boundary surface diagrams of the orbitals encloses a region of 100% probability of finding the electron.

(D) p and d-orbitals have 1 and 2 angular nodes respectively

(E) Probability density of p-orbital is zero at the nucleus

25. The number of correct statements from the following is____________

(A) E_{cell} is an intensive parameter

(B) A negative E° means that the redox couple is a stronger reducing agent than the H^+/H_2 couple.

(C) The amount of electricity required for oxidation or reduction depends on the stoichiometry of the electrode reaction.

(D) The amount of chemical reaction which occurs at any electrode during electrolysis by a current is proportional to the quantity of electricity passed through the electrolyte.

26. $Mg(NO_3)_2\ XH_2O$ and $Ba(NO_3)_2\ YH_2O$, represent formula of the crystalline forms of nitrate salts. Sum of X and Y is______________

27. The number of possible isomeric products formed when 3-chloro-1-butene reacts with HCl through carbocation formation is____________

28. 4.5 moles each of hydrogen and iodine is heated in a sealed ten litre vessel. At equilibrium, 3 moles of HI were found. The equilibrium constant for

$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ is

29. Number of compounds from the following which will not produce orange red precipitate with Benedict solution is _______________

Glucose, maltose, sucrose, ribose, 2-deoxyribose, amylose, lactose

30. The maximum number of lone pairs of electrons on the central atom from the following species is__________

ClO_3^-, XeF_4, SF_4 and I_3^-

Answer Key

Q. No.	Answer	Topic name	Chapter name
1	(3)	Magnetic Moment of Coordination Compounds	Coordination Chemistry
2	(2)	Dipole Moment of Molecule	Chemical Bonding
3	(4)	Colour of Coordination Compounds	Coordination Chemistry
4	(4)	Percentage Composition of Substance	Some Basic Concepts of Chemistry
5	(4)	Mixed Concept in Coordination Compounds	Coordination Chemistry
6	(1)	Reduction of Metal Sulphide	Metallurgy
7	(1)	Conversion of Alcohol Into Halo Alkane	Alcohol Phenol and Ether
8	(3)	Formation of Polymer	Polymer
9	(1)	Calculation of Concentration of the Reactant	Chemical Kinetics
10	(3)	Chloro Fluoro Carbon Compund	Halo Alkane and Halo Arenes
11	(1)	Electrophilic Aromatic Substitution Followed By Reduction	Aromatic Hydrocarbons
12	(4)	Wolf Kishner Reduction	Aldehyde and Ketones
13	(2)	Colour of Compound Co-ordination	Co-ordination Compound
14	(2)	Formation of Carbocation During the Reaction	General Organic Chemistry
15	(3)	Hvz Reaction and Chirality Concept	Carboxylic Acid
16	(2)	Melting Point of s Block Metals	s Block

17	**(3)**	Metal Hydrides and their Properties	Hydrogen
18	**(3)**	Reduction of Carbonyl Compounds	Aldehyde and Ketones
19	**(3)**	Formation of P Block Compounds	p Block
20	**(3)**	Relative Lowering of Vapour Pressure	Liquid Solution
21	**[4]**	Intensive and Extensive Property	Thermodynamics
22	**[224]**	Stoichiometry Relationship	Some Basic Concepts of Chemistry
23	**[3]**	Modern Adsorption Theory	Surface Chemistry
24	**[3]**	Radial Probability Function	Structure of Atom
25	**[4]**	Standard Reduction Potential and Faraday Law	Electro Chemistry
26	**[6]**	Molecular Formula of Salt	Chemical Bonding
27	**[4]**	Calculation of Number of Isomers	Isomerism
28	**[1]**	Calculation of Equilibrium Constant	Equilibrium
29	**[3]**	Benedict Test for an Aldehyde	Biomolecules
30	**[2]**	Lone Pair and Bond Pair	Chemical Bonding

Solutions

Section A

1. Option (3) is correct.

For $[Fe(H_2O)_6]^{3+}$ complex

Central atom is Fe while H_2O is ligand

The electronic configuration of

Fe:[Ar] $3d^6\,4s^2$ (z = 26)

In the given complex, oxidation state of Fe =

Fe^{+3}: $[Ar]3d^5$

↿	↿	↿	↿	↿

Here H_2O is a weak ligand and the value of Δ_0<Pairing energy ∴ Pairing of e^- does not take place. So number of unpaired e^- is 5

The value of $\mu = \sqrt{n(n+2)} = \sqrt{5(5+2)}$

$\mu = \sqrt{35} = 5.92$ B.M

For $[Fe(CN)_6]^{3-}$ complex

Central atom is Fe while CN^- is ligand

The electronic configuration Fe: $[Ar]3d^6 4s^2$

In the given complex, oxidation state of Fe=+3

Fe^{+3}: $[Ar]3d^5$

↿	↿	↿	↿	↿

Here CN^- is a strong ligand and the value of Δ_0> pairing energy ∴ it pair the unpaired electron.

Fe^{3+}

↿⇂	↿⇂	↿		

So, number of unpaired e^- =1

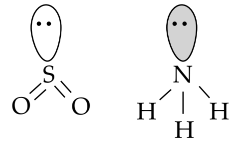
The value of $\mu = \sqrt{n(n+2)} = \sqrt{1(1+2)}$

$\mu = \sqrt{3} = 1.732$ M

So the correct answer is option (3).

2. Option (2) is correct.

Both SO_2 and NH_3 are polar molecules because they contain electron pair and due to the presence of electron pair the net dipole moment is not equal to zero.



3. Option (4) is correct.

List (I) Complex	**List (II) Color**
A. $Mg(NH_4)PO_4$	II. White
B. $K_3[Co(NO_2)_6]$	III. Yellow
C. $MnO(OH)_2$	I. Brown
D. $Fe_4[Fe(CN)_6]$	IV. Blue

4. Option (4) is correct.

Given mass of solute (X) = 2gm

Mass of solvent (H_2O) = 1 mole = 18 gm

Mass of solution = mass of solute + mass of solvent

=2 +18 = 20 gm

$$W = \frac{\text{mass of solute}}{\text{mass of solution}} \times 100 = \frac{2}{20} \times 100 = 10\%$$

5. Option (4) is correct.

If Ni^{2+} is replaced by Pt^{2+} in the complex $[NiCl_2Br_2]^{2-}$, following properties are expected to get changed-

A. Geometry of the complex gets changed when Ni^{2+} is replaced by Pt^{2+}.

$[NiCl_2Br_2]^{2-}$ is tetrahedral in shape while $[PtCl_2Br_2]^{2-}$ is square planar in shape.

Because Pt belongs to 5d series while Ni belongs to 3d series.

B. Similarly geometrical isomerism is also observed when Ni^{2+} is get replaced by Pt^{2+} because $[NiCl_2Br_2]^{2-}$ is tetrahedral

Which do not show geometrical isomerism while $[PtCl_2Br_2]^{2-}$ is square planar which show geometrical isomerism.

C. Both $[NiCl_2Br_2]^{2-}$ and $[PtCl_2Br_2]^{2-}$ do not show optical isomerism.

D. Here in $[NiCl_2Br_2]^{2-}$, Nickel is present in Ni^{+2} state and the configuration of Ni^{2+} is $3d^8$ in which 2 unpaired e^- are present

∴ It is paramagnetic in nature.

While in $[PtCl_2Br_2]^{2-}$, Platinum is present in Pt^{+2} state & the configuration of Pt^{2+} is $3d^8$ in which 2 unpaired e^- are present which get paired up by the ligand and it do not contain any unpaired e^-

∴ it is diamagnetic in nature.

6. Option (1) is correct.

A metal oxide is generally less stable than the metal sulphide ∴ reduction of metal oxide is much easier than the reduction of metal sulphide

$$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$$

7. Option (1) is correct.

$$CH_3{-}CH_2{-}\underset{|}{\underset{OH}{CH}}{-}CH_3 \xrightarrow[H_3PO_4]{NaI} CH_3{-}CH_2{-}\underset{|}{\underset{I}{CH}}{-}CH_3$$

Here the replacement of –OH group takes place via –I group through nucleophillic substitution reaction.

$$CH_3{-}CH_2{-}\underset{I}{CH}{-}CH_3 \xrightarrow[\text{ether}]{\text{Mg, dry}} CH_3{-}CH_2{-}\underset{MgI}{CH}{-}CH_3$$

Here formation of Grignard reagent takes place

$$CH_3{-}CH_2{-}\underset{MgI}{CH}{-}CH_3 \xrightarrow{D_2O} CH_3{-}CH_2{-}\underset{D}{CH}{-}CH_3$$

Here acid-base reaction takes place between Grignard reagent and D_2O

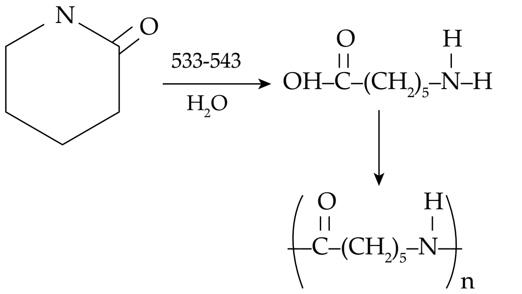
8. Option (3) is correct.

Statement I is false

Ethene at 333 to 343k and under a pressure of 6-7 atmosphere in the presence of $AlEt_3$ and $TiCl_4$ gives high density polythene (HDP) not low density polythene (LDP)

Statement II is true

Caprolactum at 533-543k in H_2O through step growth polymerizes to give Nylon-6



Nylon-6

9. Option (1) is correct.

Here the rate low expression is-

Rate = $k[A]^1[B]^1$

From (1) Rate = 0.10 mol L^{-1} s^{-1}

[A] = 20 mol L^{-1} [B] = 0.5 mol L^{-1}

$$K = \frac{\text{Rate}}{[A]^1[B]^1} = \frac{0.10 \text{ mol L}^{-1}\text{ s}^{-1}}{20 \text{ mol L}^{-1} \times 0.5 \text{ mol L}^{-1}}$$

K = 0.01 $(mol/L)^{-1}sec^{-1}$

From (2)

Rate = 0.40 mol L^{-1} s^1

[B] = 0.5 mol L^{-1}

Rate = K[A][B]

$$[A] = \frac{\text{Rate}}{K[B]} = \frac{0.40 \text{ mol L}^{-1}\text{ s}^{-1}}{0.01(\text{mol/L})^{-1}\text{ s}^{-1} \times 0.5 \text{ mol L}^{-1}}$$

[A] = 80 mol L^{-1}

From (3)

Rate = 0.80 mol L^{-1} s^{-1}

[A]=40 mol L^{-1}

$$[B] = \frac{\text{Rate}}{K[A]} = \frac{0.80 \text{ mol L}^{-1}\text{ s}^{-1}}{0.01(\text{mol/L})^{-1}\text{ s}^{-1} \times 40 \text{ mol L}^{-1}}$$

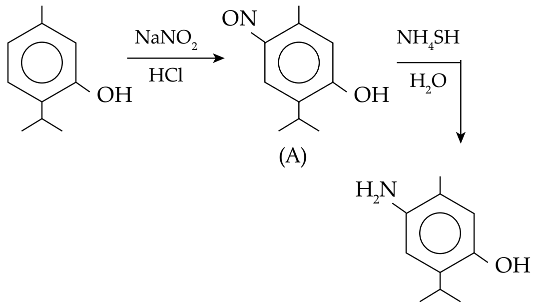
[B] = 2 mol L^{-1}

10. Option (3) is correct.

The Chlorofluorocarbon compounds of methane and ethane are collectively known as Freon.

CCl_2F_2 is one of the most common freons in industrial use. It is manufactured from tetrachloromethane by swarts reaction

11. Option (1) is correct.



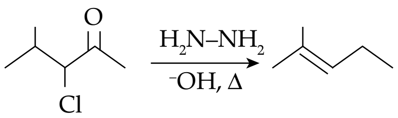
(B)

Formation of (A) takes place by electrophilic aromatic substitution reaction.

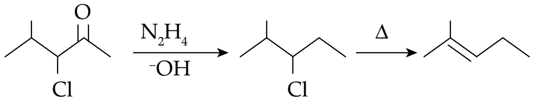
Formation of (B) takes place by reduction of –NO into $–NH_2$ by the help of NH_4SH.

12. Option (4) is correct.

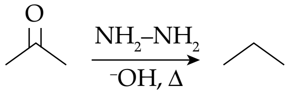
Assertion is false



Here along with the reduction of $-\overset{O}{\overset{||}{C}}-$ group we obtained alkane which on further reaction gives alkene.



Reason is true

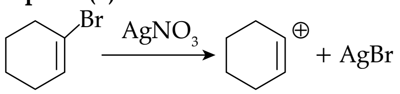


Here Wolff-kishner reduction is observed to obtain alkane

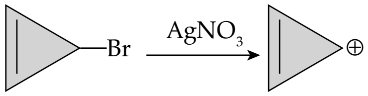
13. Option (2) is correct.

The absorption of the light depends on the strength of the ligand field. The ligand with the strong field strength cause greater splitting of the orbitals which requires a light of high frequency (low wavelength) for the transition.

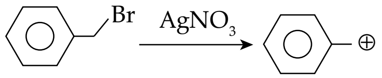
14. Option (2) is correct.



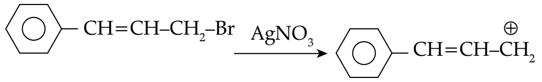
The above reaction do not takes place as we obtained unstable vinyl carbocation. While in other case stable carbocation is formed.



aromatic



Benzylic carbocation



allylic carbocation

15. Option (3) is correct.

$$H_2C-CH_2-COOH \xrightarrow[\text{Red P}]{Cl_2} H_2C-\overset{*}{C}H(Cl)-COOH$$

Here, one mole of glycine with a mole of chlorine in presence of red phosphorus generates a chiral carbon atom.

Reason is false

A molecule with 2 chiral carbon is not always optically active because it may contain POS or COS and become optically inactive.

16. Option (2) is correct.

Element	M.P
1) K	336K
2) Cs	302K
3) Rb	312K
4) Na	371K

Here in group I, alkali metal the melting point of metal decreases.

17. Option (3) is correct.

BeH_2 is an electron deficient hydride in which significant covalent character is observed while LiH is an ionic hydride and NH_3 and Hf are covalent hydride in which inter molecular hydrogen bond are present.

18. Option (3) is correct.

$$Ph-\underset{OH}{CH}-\underset{CH_3}{CH}-CH_2CHO \xrightarrow[\text{HCl, }\Delta]{\text{Zn-Hg}} Ph-CH=\overset{CH_3}{C}-CH_2CHO$$

Here the reduction of $-\overset{O}{\overset{||}{C}}-$ group takes place into $-CH_2$ group in the presence of Zn-Hg, HCl.

In the given molecule acid sensitive group like –OH is also present which on further reaction in presence of acid gives alkene.

19. Option (3) is correct.

$$P_4+8SOCl_2 \rightarrow \underset{(A)}{4PCl_3}+\underset{(B)}{2S_2Cl_2}+4SO_2$$

The numbers of moles of SO_2 produced = 4

20. Option (3) is correct.

$$\frac{P^0-Ps}{P^0}=\frac{n}{N}$$

from relative lowering of vaour pressure.

Given P°–Ps = 0.20 mm Hg

Vapour pressure of pure water = 54.2 mm Hg

Moles of H_2O (N) = $\frac{100}{18}$

Moles of glucose = *n*

$$\frac{0.2}{54.2}=\frac{n}{100/18}$$

$$n=\frac{100\times0.2}{54.2\times18}=0.0205 \text{ mole}$$

Mass of glucose= 0.0205 mol × 180 gm/mol

= 3.69 gm

Section B

21. Correct answer is [4].

Extensive property in that property which depends on the amount of substance while intensive property is the property which independent on the amount of substance.

Extensive	**Intensive**
Mole	Molar mass
Volume	Molar heat capacity
Gibbs free energy	Molarity
	E°cell

22. Correct answer is [224].

The reaction of Mg with HCl produces H_2.

$$\underset{24\text{ gm}}{Mg}+2HCl \rightarrow MgCL_2+\underset{22.4\text{ L}}{H_2}$$

24 gm Mg produces 22.4 L H_2

So, 2.4 gm Mg produces $\frac{22.4\text{ L}\times2.4\text{ gm}}{24\text{ gm}}$ =2.24 L

$\approx 224 \times10^{-2}$

23. Correct answer is [3].

According to modern adsorption theory of heterogeneous catalysis, following statement B, C and D are correct.

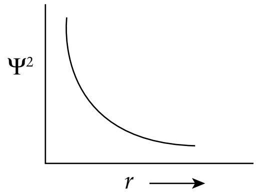
B. The adsorption of reactant molecule on the surface of catalyst.

C Through the formation of intermediate occurrence of chemical reaction takes place on the surface of catalyst.

D It is the combination of intermediate compound formation theory and old adsorption theory.

24. Correct answer is [3].

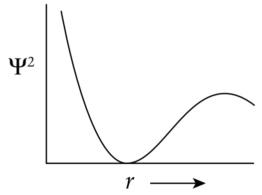
A it is correct statement



ψ^2 represent probability density which is maximum at the nucleus.

B Given statement is incorrect.

For 2S orbital, probability density first decreases & then increases



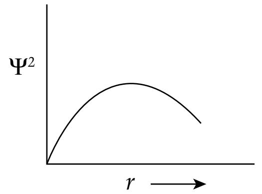
C Given statement is incorrect.

Boundary surface diagram of the orbital encloses a region of 95% probability of finding the electron.

D P-orbital have 1 while d-orbital have 2 angular nodes respectively.

E the density of P-orbital is zero at the nucleus

D and E are correct statement



25. Correct answer is [4].

A Correct statement

E°cell is intensive properties which do not depend upon the quantity of substance.

B Correct statement

If the value of E° is negative it means the redox couple is a stronger reducing agent then the H^+/H_2 couple which have E°=0.0V

C&D are correct statements

$w \propto It$

$$w = \frac{Zit}{96500}$$

26. Correct answer is [6].

The Formula of salt is

Magnesium nitrate-$Mg(NO_3)_2.6H_2O$

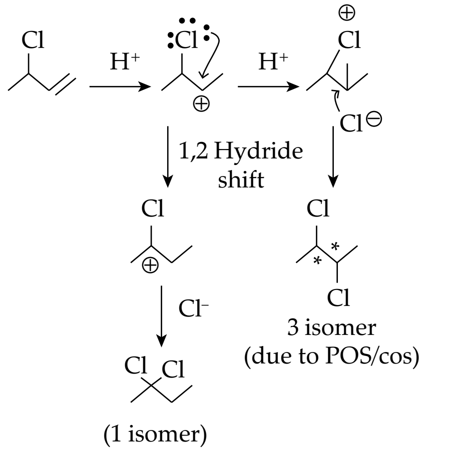
Barium nitrate- $Ba(NO_3)_2$

Here $x = 6$

$y = 0$

$x + y = 6 + 0 = 6$

27. Correct answer is [4].



Total possible product = 3 + 1 = 4 isomer

28. Correct answer is [1].

	H_2	+ I_2 $\rightleftharpoons$	2HI
T=0	4.5	4.5	–
	$-x$	$-x$	$+2x$
T=teq	$4.5-x$	$4.5-x$	$2x$

Given

$2x = 3$ mole

$x = 1.5$ moles

$[H_2] = [I_2] = 4.5 - x$

$= 4.5 - 1.5 = 3$ mol

$$K_c = \frac{[HI]^2}{[H_2][I_2]} = \frac{(3)^2}{3\times3} = 1$$

29. Correct answer is [3].

The compound which contain reducing group like –CHO, hemiacetal, hemiketol group can produce orange red precipitate with benedict solution.

Molecule	Benedict test
Glucose	✓
Maltose	✓
Sucrose	×
Ribose	✓
2-deoxy ribose	×
Amylose	×
Lactose	

30. Correct answer is [2].

The I_3^- has three lone pair of electrons.

❑❑