

Chemistry Sample Paper - 1

DIRECTIONS for the question: Mark the best option:

Question No. : 1

Calculate the molality of pure water?

- A) 55.5 B) 22.4 C) 18 D) 22.7

DIRECTIONS for the question: Mark the best option:

Question No. : 2

People living at high altitude having low concentration of oxygen in their blood and tissues, is due to _____ .

- A) low atmospheric pressure and high temperature B) low atmospheric pressure
C) low atmospheric pressure and temperature D) both low temperature and high atmospheric pressure

DIRECTIONS for the question: Mark the best option:

Question No. : 3

Calculate the depression in freezing point of a 0.01 M $MgCl_2$ solution in comparison to a 0.01 M solution of glucose.

- A) the same B) about twice C) about three times D) about four times

DIRECTIONS for the question: Mark the best option:

Question No. : 4

The value of Henry's constant (K_H) is?

- A) Lower for gases with higher solubility B) Greater for gases with lower solubility C) Constant for all gases
D) All of these

DIRECTIONS for the question: Mark the best option:

Question No. : 5

What is the average osmotic pressure of human blood is 7.8 bar at $37^\circ C$. What is the concentration of an aqueous NaCl solution that could be used in the blood stream?

- A) 0.62 mol / L B) 0.31 mol / L C) 0.16 mol / L D) 0.031 mol / L

DIRECTIONS for the question: Mark the best option:

Question No. : 6

What happened when 1 mole of benzene is mixed with 1 mole of toluene (vapour pressure of benzene — 12.8 kPa, Toluene = 3.85 kPa)

- A) The vapour will contain equal amount of benzene and toluene.
B) The vapour will contain a higher percentage of benzene C) The vapour will contain a higher percentage of toluene.
D) None of these

DIRECTIONS for the question: Mark the best option:

Question No. : 7

What is the value of molal depression constant (K_f)? If molality of dilute solution is doubled.

- A) \hat{A} ½ times B) 3 times C) unchanged D) 2 times

DIRECTIONS for the question: Mark the best option:

Question No. : 8

Calculate the mole fraction of glycerine $C_3H_5(OH)_3$ in solution containing 36 g of water and 46 g of glycerine .

- A) 0.046 B) 0.40 C) 0.20 D) 0.0.020

DIRECTIONS for the question: Mark the best option:

Question No. : 9

The boiling point of an azeotropic mixture of water and ethanol is less than that of water and ethanol. The mixture shows

- A) no deviation from Raoult's Law B) positive deviation from Raoult's Law C) negative deviation from Raoult's Law
D) Both a and b

DIRECTIONS for the question: Mark the best option:

Question No. : 10

What happens when on adding salt to water while boiling an egg?

- A) decrease the boiling point B) increase the boiling point C) prevent the breaking of eggs D) make eggs tasty

DIRECTIONS for the question: Mark the best option:

Question No. : 11

Which relationship is correct?

- A) $\Delta T_b = \frac{K_b \cdot 1000 \cdot W_2}{M_2 \cdot W_1}$ B) $\frac{p^\circ - p_i}{p^\circ} = \frac{W_2}{M_2} \times \frac{M_1}{W_1}$ C) $\pi = \frac{n}{V}$ D) All of these

DIRECTIONS for the question: Mark the best option:

Question No. : 12

Electrodes of a conductivity cell is made up of

- A) Gold B) Hydrogen C) Platinised platinum D) zinc

DIRECTIONS for the question: Mark the best option:

Question No. : 13

Calculate equilibrium constant of the reaction ? If standard emf of a galvanic cell involving cell reaction with $n = 2$ is formed to be 0.295 V at $25\hat{A}^\circ$ C.

- A) $1.0 \hat{A} - 10^{10}$ B) $1.0 \hat{A} - 10^{13}$ C) $2.0 \hat{A} - 10^{12}$ D) $1.0 \hat{A} - 10^9$

DIRECTIONS for the question: Mark the best option:

Question No. : 14

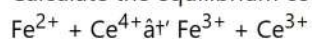
What happened during charging of the lead storage battery.

- A) PbSO₄ anode is reduced to Pb. B) PbSO₄ cathode is reduced to PbO₂. C) PbSO₄ cathode is oxidised to Pb.
D) PbSO₄ anode is oxidised to Pb.

DIRECTIONS for the question: Mark the best option:

Question No. : 15

Calculate the equilibrium constant for the reaction



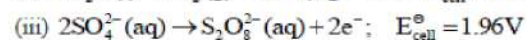
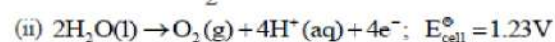
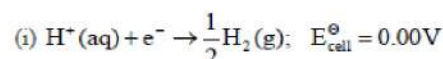
Given standard $E_{\text{Ce}^{4+}/\text{Ce}^{3+}} = 1.44\text{V}$ and standard $E_{\text{Fe}^{3+}/\text{Fe}^{2+}} = 0.68\text{V}$

- A) 7.6×10^{12} B) 76.0×10^{12} C) 0.76×10^{-12} D) 3.5×10^{12}

DIRECTIONS for the question: Mark the best option:

Question No. : 16

On the basis of E^{\ominus} cell for half cell reactions Mark the correct answer.

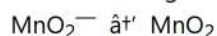


- A) In dilute sulphuric acid solution SO₄²⁻ ion will be reduced at cathode.
B) In the concentrated sulphuric acid solution, water will be oxidised at anode.
C) In the dilute sulphuric acid solution, water will be oxidised at anode.
D) In dilute sulphuric acid solution, SO₄²⁻ ion will be oxidised to tetrathionate ion at anode.

DIRECTIONS for the question: Mark the best option:

Question No. : 17

In the following reaction charge required for the reduction of 1 mol is



- A) 2 F B) 3 F C) 5 F D) 4 F

DIRECTIONS for the question: Mark the best option:

Question No. : 18

Which of the following reaction is used to make fuel cell?

- A) $\text{Cd}(\text{s}) + 2\text{Ni}(\text{OH})_2(\text{s}) \rightarrow \text{CdO}(\text{s}) + 2\text{Ni}(\text{OH})_2(\text{s}) + \text{H}_2\text{O}(\text{l})$ B) $\text{Pb}(\text{s}) + \text{PbO}_2(\text{s}) + 2\text{H}_2\text{SO}_4(\text{aq}) \rightarrow 2\text{PbSO}_4(\text{s}) + 2\text{H}_2\text{O}(\text{l})$
C) $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$ D) All of these

DIRECTIONS for the question: Mark the best option:

Question No. : 19

$\text{Cr}_2\text{O}_7^{2-} + \text{X H}^+ \text{Cr}^{3+} + \text{H}_2\text{O} + \text{Oxidised product of X}$
In this reaction X will be

- A) $\text{Cr}_2\text{O}_7^{2-}$ B) Fe^{2+} C) HSO_3^- D) H_2S

DIRECTIONS for the question: Mark the best option:

Question No. : 20

The emf of the cell: $\text{Ni} / \text{Ni}^{2+} (1.0 \text{ M}) // \text{Au}^{3+} (1.0 \text{ M}) / \text{Au}$ ($E^\circ = -0.25 \text{ V}$ for Ni^{2+}/Ni ; $E^\circ = 1.5 \text{ V}$ for Au^{3+}/Au) is

- A) 1.25 V B) +1.75 V C) 1.75 V D) 1.0 V

DIRECTIONS for the question: Mark the best option:

Question No. : 21

Calculate the value equilibrium constant for the cell reaction. If its emf of the cell $\text{Zn} | \text{Zn}^{2+} (0.01 \text{ M}) || \text{Fe}^{2+} (0.001 \text{ M}) | \text{Fe}$. A 298 K.

- A) 100.64/0.0295 B) 100.32/0.0295 C) 100.032/0.0591 D) 100.42/0.0591

DIRECTIONS for the question: Mark the best option:

Question No. : 22

Which of the following is the Metalloid of Nitrogen family?

- A) N B) P C) As D) Bi

DIRECTIONS for the question: Mark the best option:

Question No. : 23

Why is the increase in the Radius is less Predominant beyond Phosphorous?

- A) High Shielding effect of d — orbital B) Low Shielding effect of d — orbital C) Absence of d & f orbital
D) None of above

DIRECTIONS for the question: Mark the best option:

Question No. : 24

Which one of the following has Highest Melting Point in Group 15?

- A) Bi B) As C) P D) Si

DIRECTIONS for the question: Mark the best option:

Question No. : 25

The Stable Oxidation State of Bismuth is

- A) +1 B) +5 C) -3 D) +3

DIRECTIONS for the question: Mark the best option:

Question No. : 26

Among the 15th group elements, as we move from nitrogen to bismuth, the pentavalency becomes less pronounced and trivalency becomes more pronounced due to

- A) Non metallic character B) High electronegativity C) Large ionization energy D) Inert pair effect

DIRECTIONS for the question: Mark the best option:

Question No. : 27

Why does Nitrogen exist only as a diatomic molecule

- A) small size B) High electronegativity C) Strong π - π multiple bonds D) All of above

DIRECTIONS for the question: Mark the best option:

Question No. : 28

Why is the N-N bond weaker than P — P, As — As and Sb — Sb Single bond?

- A) High electronegativity B) π - π bond C) Interelectronic repulsion D) All above

DIRECTIONS for the question: Mark the best option:

Question No. : 29

Which of the following cannot form π - π bond

- A) N B) P C) As D) Sb

DIRECTIONS for the question: Mark the best option:

Question No. : 30

The Largest bond angle is in:-

- A) AsH_3 B) NH_3 C) H_2O D) PH_3

DIRECTIONS for the question: Mark the best option:

Question No. : 31

Which of the following can more readily donate lone pair?

- A) NH_3 B) PH_3 C) AsH_3 D) BiH_3

DIRECTIONS for the question: Mark the best option:

Question No. : 32

Most acidic oxide among the following is-

- A) N_2O_5 B) P_2O_5 C) N_2O_4 D) As_2O_3

DIRECTIONS for the question: Mark the best option:

Question No. : 33

Why Nitrogen cannot form pentahalide?

- A) Small size B) High electronegativity C) Non availability of d orbital in its valence shell D) Strong triple bond

DIRECTIONS for the question: Mark the best option:

Question No. : 34

Which of the following Statement is correct?

- A) Pentahalides are more covalent than trihalides B) Pentahalides are less covalent than trihalides
C) Pentahalides & trihalides are equally covalent D) None of the above

DIRECTIONS for the question: Mark the best option:

Question No. : 35

Correct order of Bond angle is-

- A) $PF_3 > PCl_3 > PBr_3 > PI_3$ B) $PF_3 < PCl_3 < PBr_3 < PI_3$ C) $PF_3 = PCl_3 < PBr_3 < PI_3$ D) $PF_3 > PCl_3 < PBr_3 > PI_3$

DIRECTIONS for the question: Mark the best option:

Question No. : 36

Two stable isotopes of N are:-

- A) $^{14}N, ^{13}N$ B) $^{14}N, ^{15}N$ C) $^{16}N, ^{18}N$ D) $^{15}N, ^{16}N$

DIRECTIONS for the question: Mark the best option:

Question No. : 37

Dinitrogen is used in

- A) Manufacturing of NH_3 & calcium cyanamide B) Providing an Inert atmosphere & as an inert diluent
C) Preserving biological material & in Cryosurgery D) All the above

DIRECTIONS for the question: Mark the best option:

Question No. : 38

NH_4Cl on heating with NaOH liberates

- A) NaCl B) NH_3 C) HCl D) NaOCl

DIRECTIONS for the question: Mark the best option:

Question No. : 39

The Shape of NH_3 molecule is:-

- A) Tetrahedral B) Pyramidal C) Planar D) Octa

DIRECTIONS for the question: Mark the best option:

Question No. : 40

Liquid NH_3 bottles are opened after cooling them in Ice for sometimes. It is because Liquid NH_3

- A) Brings tears to the eyes B) Has high vapour pressure C) Is corrosive liquid D) Is a mild explosive

DIRECTIONS for the question: Mark the best option:

Question No. : 41

Which Salt is produced while detection of Cu^{+2} & Ag^+ ions with the help of liquid NH_3

- A) $[\text{Cu}(\text{H}_2\text{O})_4]^{2+}$ - Blue ; $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$ — colourless B) $[\text{Cu}(\text{NH}_3)_4]^{2+}$ - colourless ; $[\text{Ag}(\text{H}_2\text{O})_2]$ —Blue
C) $[\text{Cu}(\text{NH}_3)_4]^{2+}$ - Light Blue; AgCl — Colourless D) $[\text{Cu}(\text{NH}_3)_4]^{2+}$ - Deep Blue; $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$ — Colourless

DIRECTIONS for the question: Mark the best option:

Question No. : 42

The Laughing gas is

- A) NO B) N_2O C) NO_2 D) N_2O_3

DIRECTIONS for the question: Mark the best option:

Question No. : 43

Which of the following shows Nitrogen with its Increasing order of Oxidation No.?

- A) $\text{NO} < \text{N}_2\text{O} < \text{NO}_2 < \text{NO}_2^- < \text{NO}_4^+$ B) $\text{NH}_4^+ < \text{N}_2\text{O} < \text{NO}_2 < \text{NO}_3^- < \text{NO}$ C) $\text{NH}_4^+ < \text{N}_2\text{O} < \text{NO} < \text{NO}_2 < \text{NO}_3^-$
D) $\text{NH}_4^+ < \text{NO} < \text{N}_2\text{O} < \text{NO}_2 < \text{NO}_3^+$

DIRECTIONS for the question: Mark the best option:

Question No. : 44

Oxide of Nitrogen formed by heating Ammonium Nitrate Crystal is-

- A) N_2O_4 B) NO_2 C) N_2O D) NO

DIRECTIONS for the question: Mark the best option:

Question No. : 45

N_2O_4 is mixed Anhydride of-

- A) $\text{HNO}_3 + \text{NO}$ B) $\text{HNO}_2 + \text{HNO}_3$ C) $\text{HNO}_2 + \text{NO}_2$ D) $\text{HNO}_3 + \text{NH}_3$

DIRECTIONS for the question: Mark the best option:

Question No. : 46

Blue liquid among the following is —

- A) N_2O B) N_2O_5 C) N_2O_3 D) NO

DIRECTIONS for the question: Mark the best option:

Question No. : 47

Solid N_2O_5 is called Nitronium Nitrate because it exist as:-

- A) $NO_3^+NO_3^-$ B) $NO_2^+NO_3^-$ C) NO_2NH_2 D) N_5O_6

DIRECTIONS for the question: Mark the best option:

Question No. : 48

The correct order of bond angle of NO_2^+ , NO_2 and NO_2^- is

- A) $NO_2^+ < NO_2 < NO_2^-$ B) $NO_2^+ = NO_2^- < NO_2$ C) $NO_2^+ > NO_2 > NO_2^-$ D) $NO_2^+ > NO_2 < NO_2^-$

DIRECTIONS for the question: Mark the best option:

Question No. : 49

Mixture of conc. HNO_3 & conc. H_2SO_4 is known as

- A) Sulphanating mixture B) Nitration mixture C) Explosion mixture D) Fusion mixture

DIRECTIONS for the question: Mark the best option:

Question No. : 50

The industrial preparation of HNO_3 by Ostwald's process involves-

- A) Reduction of NH_3 B) Oxidation of NH_3 C) Hydrogenation of NH_3 D) Hydrolysis of NH_3

QNo:- 1 ,Correct Answer:- A

Explanation:- Molality = Number of moles/kg of solvent

$$= \frac{1000}{\text{kg of solvent}} = 55.5 \text{ moles / kg}$$

QNo:- 2 ,Correct Answer:- B

Explanation:-

QNo:- 3 ,Correct Answer:- C

Explanation:- It will be nearly 3 times because a number of particles in $MgCl_2 \hat{a}r Mg^{2+} + 2Cl^-$ are thrice than glucose.

QNo:- 4 ,Correct Answer:- B

Explanation:-

QNo:- 5 ,Correct Answer:- B

Explanation:- $\pi = cRT$

QNo:- 6 ,Correct Answer:- B

Explanation:-

It is because benzene has high vapour pressure, it will form more vapours as compared to toluene.

QNo:- 7 ,Correct Answer:- C

Explanation:- K_f does not depend upon 'mMt depends upon nature of solvent.

QNo:- 8 ,Correct Answer:- C

Explanation:-

QNo:- 9 ,Correct Answer:- B

Explanation:-

QNo:- 10 ,Correct Answer:- B

Explanation:-

QNo:- 11 ,Correct Answer:- D

Explanation:-

QNo:- 12 ,Correct Answer:- C

Explanation:- Electrodes are made up platinised platinum because it is inert.

QNo:- 13 ,Correct Answer:- A

Explanation:-

QNo:- 14 ,Correct Answer:- A

Explanation:- $2PbSO_4 + 2H_2O \hat{a}t' Pb + PbO_2 + 2H_2SO_4$

QNo:- 15 ,Correct Answer:- A

$$E_{cell}^{\ominus} = \frac{0.059}{1} \log_{10} K_e$$

Explanation:- $E_{cell}^{\ominus} = E_{Pb^{2+}/Pb}^{\ominus} - E_{PbO_2/Pb^{2+}}^{\ominus}$

QNo:- 16 ,Correct Answer:- A

At cathode: $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2(\text{g})$

Explanation:- At anode: $\text{H}_2\text{O} \rightarrow \frac{1}{2}\text{O}_2 + 2\text{H}^+ + 2\text{e}^-$

QNo:- 17 ,Correct Answer:- B

Explanation:-

QNo:- 18 ,Correct Answer:- C

Explanation:-

QNo:- 19 ,Correct Answer:- B

Explanation:-

QNo:- 20 ,Correct Answer:- C

Explanation:-

QNo:- 21 ,Correct Answer:- B

Explanation:-

QNo:- 22 ,Correct Answer:- C

Explanation:-

QNo:- 23 ,Correct Answer:- B

Explanation:-

QNo:- 24 ,Correct Answer:- B

Explanation:-

QNo:- 25 ,Correct Answer:- D

Explanation:-

QNo:- 26 ,Correct Answer:- D

Explanation:-

QNo:- 27 ,Correct Answer:- C

Explanation:-

QNo:- 28 ,Correct Answer:- C

Explanation:-

QNo:- 29 ,Correct Answer:- A

Explanation:-

QNo:- 30 ,Correct Answer:- B

Explanation:-

QNo:- 31 ,Correct Answer:- A

Explanation:-

QNo:- 32 ,Correct Answer:- A

Explanation:-

QNo:- 33 ,Correct Answer:- C

Explanation:-

QNo:- 34 ,Correct Answer:- A

Explanation:-

QNo:- 35 ,Correct Answer:- B

Explanation:-

QNo:- 36 ,Correct Answer:- B

Explanation:-

QNo:- 37 ,Correct Answer:- D

Explanation:-

QNo:- 38 ,Correct Answer:- B

Explanation:-

QNo:- 39 ,Correct Answer:- B

Explanation:-

QNo:- 40 ,Correct Answer:- B

Explanation:-

QNo:- 41 ,Correct Answer:- A

Explanation:-

QNo:- 42 ,Correct Answer:- B

Explanation:-

QNo:- 43 ,Correct Answer:- C

Explanation:-

QNo:- 44 ,Correct Answer:- C

Explanation:-

QNo:- 45 ,Correct Answer:- B

Explanation:-

QNo:- 46 ,Correct Answer:- C

Explanation:-

QNo:- 47 ,Correct Answer:- B

Explanation:-

QNo:- 48 ,Correct Answer:- C

Explanation:-

QNo:- 49 ,Correct Answer:- B

Explanation:-

QNo:- 50 ,Correct Answer:- B

Explanation:-
