23/08/2022
Slot-1

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Answers & Solutions

for

CUET UG-2022

(CHEMISTRY)

Time : 45 min. **M.M. : 200**

IMPORTANT INSTRUCTIONS:

1. The test is of 45 Minutes duration.
2. The test contains 50 Questions out of which 40 questions need to be attempted.
3. Marking Scheme of the test:
   a. Correct answer or the most appropriate answer: Five marks (+5)
   b. Any incorrect option marked will be given minus one mark (–1).
   c. Unanswered/Marked for Review will be given no mark (0).

Choose the correct answer:

Question ID: 692661

Which of the following shows both Frenkel as well as Schottky defects?

(A) AgBr (B) NaCl

(C) KCl (D) AgCl

Answer (A)

Sol. AgBr shows both, Frenkel as well as Schottky defects.

Question ID: 692662

Which of the following is correct for a hexagonal crystal system?

(A) $a = b \neq c, \alpha = \beta = \gamma = 90°$

(B) $a \neq b \neq c, \alpha = \beta = \gamma = 90°$

(C) $a = b \neq c, \alpha = \beta = 90°, \gamma = 120°$

(D) $a \neq b \neq c, \alpha = \gamma = 90°, \beta \neq 90°$

Answer (C)

Sol. For hexagonal crystal system,

$a = b \neq c$ and $\alpha = \beta = 90°$

$\gamma = 120°$

Question ID: 692663

Efficiency of packing in body centred cubic structures is found to be

(A) 33% (B) 74%

(C) 52.4% (D) 68%

Answer (D)

Sol. For body centred cubic structures,

$$\sqrt{3}a = 4r$$

Packing efficiency

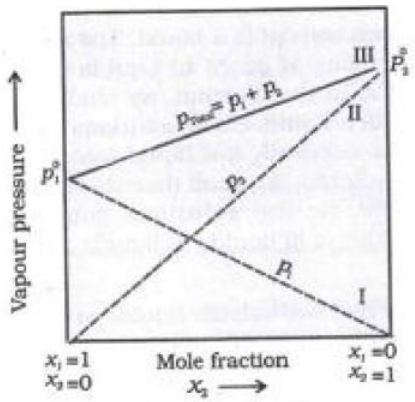
$$= \frac{\text{Volume occupied by two spheres in unit cell} \times 100}{\text{Volume of unit cell}}$$

$$= \frac{2 \times \frac{4}{3}\pi r^3}{a^3} \times 100$$

$$= \frac{\left(\frac{8}{3}\right)\pi r^3 \times 100}{\left(\frac{4r}{\sqrt{3}}\right)^3} = 68\%$$

Question ID: 692664

Observe the given graph and identify the correct statement for the solution.



(A) Component 2 is more volatile than component 1

(B) Component 1 is more volatile than component 2

(C) Boiling point of component 1 is lower than that of component 2

(D) Volatility of a component depends upon its mole fraction

Answer (A)

Sol. The plot of vapour pressure and mole fraction of an ideal solution is at constant temperature. Here, p_1^o and p_2^o are the vapour pressures of pure component 1 and 2 respectively. As, $p_2^o > p_1^o$, that means component 2 is more volatile than component 1.

So, boiling point of component 1 is greater than component 2.

Question ID: 692665

18 g of a non-volatile solution A is dissolved in 1 kg of water, the boiling point of water is raised to 373.51 K. Given K_b for water is 0.52 K kg mol^{-1}, boiling point for water is 373.15 K at 1.013 bar pressure.

The molecular weight of the solid A is

(A) 58.0 g mol^{-1} (B) 26.0 g mol^{-1}

(C) 55.0 g mol^{-1} (D) 110.0 g mol^{-1}

Answer (B)

Sol. Elevation in boiling point is denoted by ΔT_b.

$\Delta T_b = K_b \times m$ (where m is molality)

$T_i = 373.15$ K and $T_f = 373.51$ K

$\Delta T_b = 373.51 - 373.15 = 0.36$

$$0.36 = 0.52 \times \frac{18}{M_A \times 1}$$

$M_A = 26\ g\ mol^{-1}$

Question ID: 692666

Based on solute solvent interactions, arrange the following in the order of increasing solubility in n-octane.

A. Cyclohexane B. KCl

C. CH_3OH D. CH_3NH_2

E. CH_3CN

Choose the correct answer from the options given below.

(A) A < B < C < D < E (B) B < C < E < D < A

(C) C < B < A < E < D (D) B < C < D < E < A

Answer (D)

Sol. According to like-dissolve-like theory, polar species are soluble with polar solvent and non-polar species are soluble with non-polar solvent.

n-octane $\rightarrow$ non-polar in nature

(A) Cyclohexane $\rightarrow$ non-polar in nature

(B) KCl $\rightarrow$ highly polar due to K^+ and Cl^- ions

(C) CH_3OH $\rightarrow$ polar in nature due to high electronegativity difference between O and H.

(D) CH_3NH_2 $\rightarrow$ polar in nature due to electronegativity difference between N and H

(E) CH_3CN $\rightarrow$ less polar in nature.

So, correct order of solubility in n-octane is

B < C < D < E < A

Question ID:692667

In a pseudo first order reaction, the rate constant

(A) Is independent of the concentration of reactants

(B) Depends on concentration of reactants present in small quantity

(C) Depends on temperature

(D) Depends on concentration of reactants present in excess

Answer (D)

Sol. In a pseudo first order reaction, the rate of reaction is affected by concentration of reactant only and rate constant depends on concentration of excess reagent.

Note: Rate constant depends on temperature also.

Question ID:692668

When the temperature of a reaction is increased by 20°C, the rate of reaction increases by

(A) 3 times (B) 4 times

(C) 2 times (D) 1.5 times

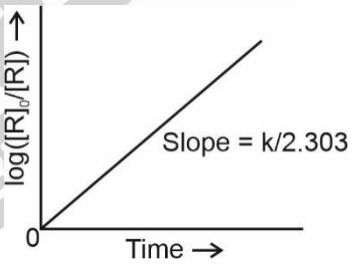
Answer (B)

Sol. For a chemical reaction with rise in temperature by 10°C, the rate constant is nearly doubled.

So, for 20°C rise in temperature, the rate constant increases by four times.

Question ID:692669

Observe the given graph. What will be the unit for the rate constant?



(A) mol L^{-1} s^{-1} (B) mol^{-1} L s^{-1}

(C) s^{-1} (D) mol^{-2} L^2 s^{-1}

Answer (C)

Sol. For first order reaction

$$k = \frac{2.303}{t} \log \frac{[R]_0}{[R]}$$

$$\log \frac{[R]_0}{[R]} = \frac{k}{2.303} \times t$$

This equation represents y = mx (straight line)

$$\text{Slope} = \frac{k}{2.303}$$

Unit of rate constant $= (\text{mol } L^{-1})^{1-1}\ s^{-1}$

$= s^{-1}$

Question ID:6926610

For a chemical reaction :

$A + B \rightarrow$ Products

Experiment	$\frac{[A]}{mol\ L^{-1}}$	$\frac{[A]}{mol\ L^{-1}}$	$\frac{Initial\ rate}{mol\ L^{-1}\ s^{-1}}$
1.	0.1	0.1	2.0×10^{-3}
2.	0.2	0.2	4.0×10^{-3}
3.	0.1	0.2	2.0×10^{-3}

Which is the overall order of chemical reaction?

(A) 3

(B) 1

(C) 2

(D) 0

Answer (B)

Sol. Let, rate = $k[A]^x[B]^y$

From data 1 in experiment,

$2 \times 10^{-3} = k[0.1]^x[0.1]^y$ …(i)

From data 2,

$4 \times 10^{-3} = k[0.2]^x[0.2]^y$ …(ii)

From data 3,

$2 \times 10^{-3} = k[0.1]^x[0.2]^y$ …(iii)

Dividing equation (i) and (iii)

$$\frac{2\times10^{-3}}{2\times10^{-3}} = \frac{k[0.1]^x[0.1]^y}{k[0.1]^x[0.2]^y} = \left(\frac{1}{2}\right)^y$$

$y = 0$

Put the value of y in equation (i) and (ii),

$2 \times 10^{-3} = k[0.1]^x[0.1]^0$ …(iv)

$4 \times 10^{-3} = k[0.2]^x[0.2]^0$ …(v)

Dividing equation (iv) and (v),

$$\frac{1}{2} = \left(\frac{0.1}{0.2}\right)^x \Rightarrow x = 1$$

So, overall order = x + y = 1 + 0 = 1

Question ID:6926611

Match List-I with List-II.

	List-I (Example of colloidal system)		**List-II (Types of colloid)**
A.	Smoke	I.	Foam
B.	Cheese	II.	Aerosol
C.	Soap lather	III.	Emulsion
D.	Milk	IV.	Gel

Choose the correct answer from the options given below:

(A) A-II, B-IV, C-I, D-III

(B) A-I, B-II, C-III, D-IV

(C) A-I, B-III, C-II, D-IV

(D) A-IV, B-III, C-II, D-I

Answer (A)

Sol. Correct match is given below:

Example of colloidal system		**Types of colloid**
Smoke	→	Aerosol
Cheese	→	Gel
Soap lather	→	Foam
Milk	→	Emulsion

Question ID:6926612

The colloids that cannot be easily coagulated are

(A) Lyophobic colloids

(B) Lyophilic colloids

(C) Irreversible sols

(D) Associated colloids

Answer (B)

Sol. Lyophilic colloids are quite stable and cannot be easily coagulated.

Question ID 6926613

Which of the following ores can be concentrated using froth floatation process?

(A) Magnetite (B) Calamine

(C) Copper Pyrites (D) Bauxite

Answer (C)

Sol. Froth floatation process is generally used for removing gangue from sulphide ores.

So, this method is used for copper pyrites (FeS_2)

Question ID 6926614

Match List I with List II

List I (Ore)		List II (Molecular form)	
A	Haematite	I.	$CuCO_3.Cu(OH)_2$
B	Malachite	II	Na_3AlF_6
C	Calamine	III	Fe_2O_3
D	Cryolite	IV	$ZnCO_3$

Choose the correct answer from the options given below :

(A) A(III), B(I), C(IV), D(II)

(B) A(I), B(III), C(I), D(IV)

(C) A(IV), B(II), C(I), D(III)

(D) A(II), B(IV), C(III), D(I)

Answer (A)

Sol. Correct watch of ore and its molecular form :

A. Haematite $\longrightarrow Fe_2O_3$

B. Malachite $\longrightarrow CuCO_3.Cu(OH)_2$

C. Calamine $\longrightarrow ZnCO_3$

D. Cryolite $\longrightarrow Na_3AlF_6$

Question ID 6927415

The correct order of boiling points for hydrogen halides is

A. HCl B. HBr

C. HF D. HI

Choose the correct answer from the options given below :

(A) HF < HI < HBr < HCl

(B) HF < HCl < HBr < HI

(C) HF > HCl > HBr > HI

(D) HF > HI > HBr > HCl

Answer (D)

Sol. HF has exceptionally high boiling point due to intermolecular H-Bonding.

So, correct order of Boiling point is :

HF > HI > HBr > HCl

Question ID 6926616

In the reaction

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g), \Delta_f H^{\theta} = -46.1\,kJ\,mol^{-1}$

The yield of ammonia is expected to be maximum at

(A) High temperature and low pressure

(B) High temperature and high pressure

(C) Low temperature and high pressure

(D) Low temperature and low pressure

Answer (C)

Sol. Formation of ammonia is an exothermic process, so low temperature favours formation of ammonia. On increasing pressure, again reaction moves in forward direction to increase the yield of ammonia.

Question ID 6926617

The structure of SF_4 is

(A) Square planar

(B) Tetrahedral

(C) Trigonal bipyramidal

(D) Octahedral

Answer (C)

Sol. In SF_4, 'S' atom is sp^3d hybridised So, its geometry (structure) is trigonal bipyramidal.

Question ID 6926618

Which of the following interhalogen compound does not exist?

(A) BrF (B) BrF_3

(C) BrF_2 (D) BrF_5

Answer (C)

Sol. Out of all interhalogen compounds, BeF_2 does not exist.

BrF	Pale brown gas
BrF_3	Yellow green liquid
BrF_5	Colourless liquid

Question ID: 6926619

The electronic configuration of Cu in +1 oxidation state is

(A) $[Ar]3d^{10}$ (B) $[Ar]^3d^94s^1$

(C) $[Ar]3d^{10}4s^1$ (D) $[Ar]3d^94s^2$

Answer (A)

Sol. Electronic configuration of Cu(z = 29) = $[Ar]3d^{10}4s^1$

Electronic configuration of Cu^+ ion = $[Ar]3d^{10}$

Question ID: 6926620

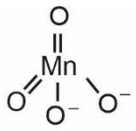
Chemical formula and colour of manganate ion is___

(A) MnO_4^{2-}, Green (B) MnO_4^-, Green

(C) MnO_4^-, Purple (D) MnO_4^{2-}, Purple

Answer (A)

Sol.



Manganate ion
(green in colour)

Question ID: 6926621

Which of the following elements is **not** regarded as a transition metal?

(A) Cu (B) Sc

(C) Mn (D) Zn

Answer (D)

Sol. Zn, Cd and Hg of group 12 have full d^{10} configuration in their ground state as well as in their common oxidation states and hence, are not regarded as transition metals.

Question ID: 6926622

Coordination number of central metal ion in $[Cu(H_2O)_4en]^{2+}$ is

(A) 3 (B) 4

(C) 5 (D) 6

Answer (D)

Sol. $[Cu(H_2O)_4en]^{2+}$

H_2O is unidentate and ethylene diamine (en) is bidentate in nature.

So, coordination number of Cu = 6

Question ID: 6926623

Oxidation number of cobalt ion in $[CoCl_2(en)_2]^+$ will be

(A) 2 (B) 3

(C) 4 (D) 5

Answer (B)

Sol. $[\overset{x}{Co}Cl_2(en)_2]^+$

$x + 2(-1) + 2(0) = +1$

$x = +3$

Oxidation state of cobalt is +3.

Question ID: 6926624

Number of ions produced on hydrolysis of $Cr(NH_3)_4Cl_3$ reacting with $AgNO_3$ to give 1 mole of AgCl, will be

(A) 2 (B) 3

(C) 4 (D) 5

Answer (A)

Sol. $[Cr(NH_3)_4Cl_2]Cl + AgNO_3 \rightarrow$

$[Cr(NH_3)_4Cl_2]NO_3 + AgCl$

So, on hydrolysis two ions will be produced.

Question ID: 6926625

Hybridisation state of central metal ion in $[Fe(NH_3)_4(en)]^{2+}$ will be

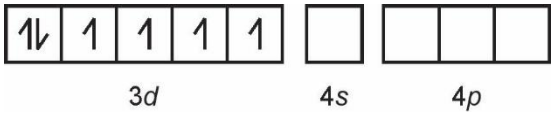
(A) sp^3 (B) dsp^2

(C) d^2sp^3 (D) sp^3d^2

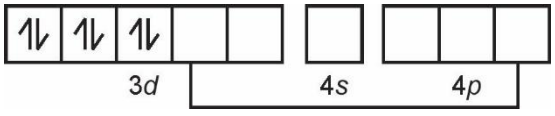
Answer (C)

Sol. $[Fe(NH_3)_4(en)]^{2+}$

Electronic configuration of Fe^{2+} ion = $[Ar]3d^6$



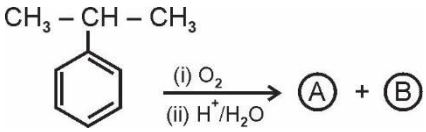
As, Ethylene diamine is strong field ligand, so pairing takes place.

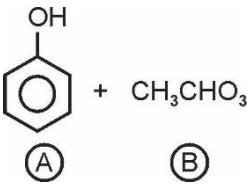


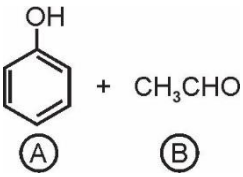
So, hybridisation of Fe is d^2sp^3

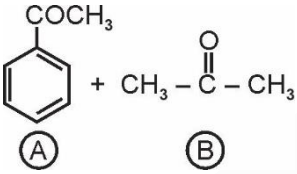
Question ID: 6926626

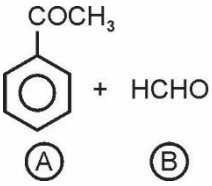
What are the products obtained in the chemical reaction?



(A) 

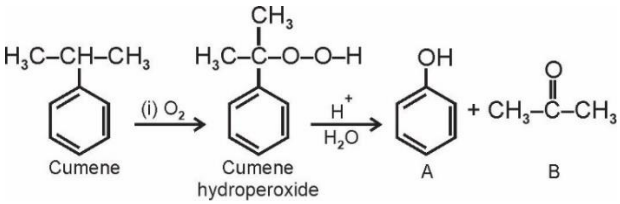
(B) 

(C) 

(D) 

Answer (NA)

Sol.



Question ID: 6926627

The IUPAC name of glycerol is

(A) 2-Methyl phenol

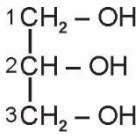
(B) Propane-1, 2, 3-triol

(C) 2-Methylpropan-2-0l

(D) 2-Methylcyclopentanol

Answer (B)

Sol.



Propan-1, 2, 3-triol

(glycerol)

Question ID: 6926628

Which set of reagents will be most suitable to bring about the following change?

2, 4, 6-Trinitochlorobenzene to picric acid

(A) NaOH, 623 K, 300 atm

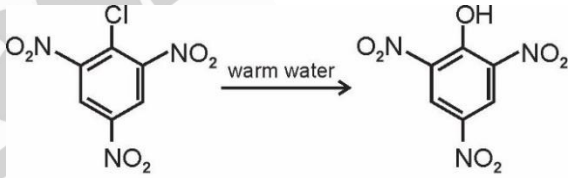
(B) Hot conc sulphuric acid

(C) Warm water

(D) Acidified water

Answer (C)

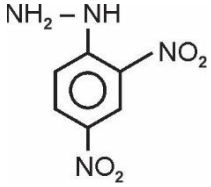
Sol.



2 4 6-trinitrochlorobenzene Picric acid

Question ID: 6926629

Match List I with List II

Reagent (R)	Name of the product formed on addition to carbonyl compounds (P)
A. NH_2 NH CO NH_2	I. Imine
B. NH_2 – OH	II. Hydroazone
C. NH_2NH_2	III. 2, 4-Dinitrophenylhydrazone
D. 	IV. Semicarbazone

Choose the correct answer from the options given below :

(A) A-I, B-III, C-IV, D-II

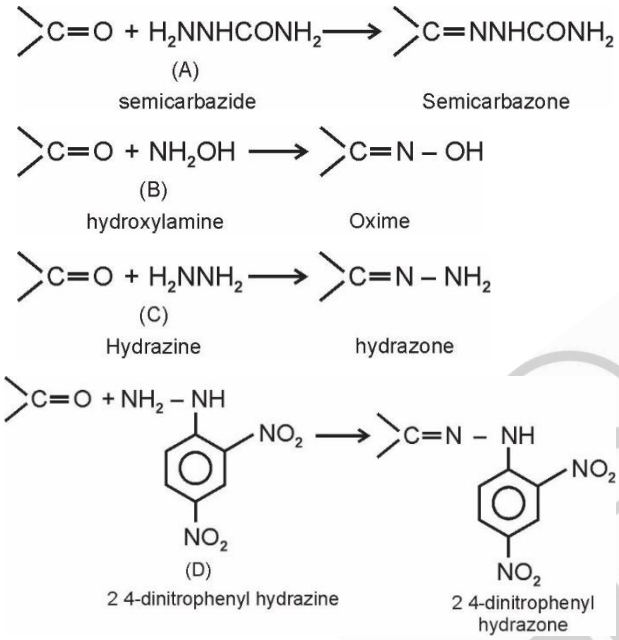
(B) A-IV, B-I, C-II, D-III

(C) A-II, B-III, C-IV, D-I

(D) A-II, B-III, C-I, D-IV

Answer (NA)

Sol.



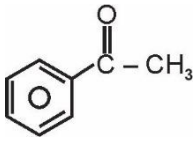
Note : Instead of Imine, there must be oxime.

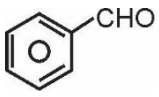
Question ID: 6926630

$RCOCl + H_2 \xrightarrow{Pd, BaSO_4} X + HCl$

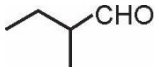
X can be

A. CH_3COCH_3

B. 

C. 

D $CH_3CH_2COCH_3$

E. 

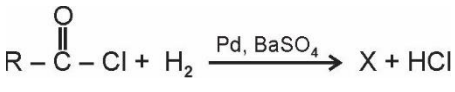
Choose the correct answer from the options given below:

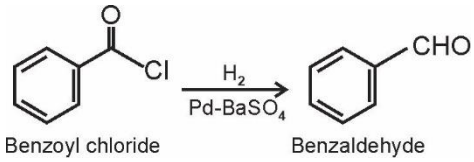
(A) A, B and C only (B) B, C and D only

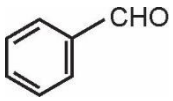
(C) C and E only (D) B and D only

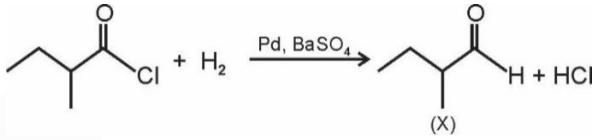
Answer (C)

Sol.

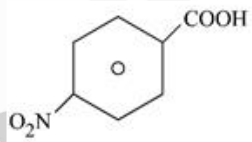




So, X is 



Question ID:6926631

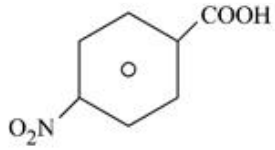
pK_a value of 

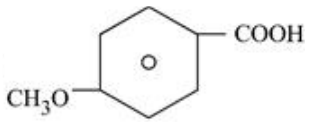
is less than of 

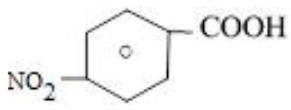
because

(A) NO_2 is an electron donating group which increases electron- density on ring.

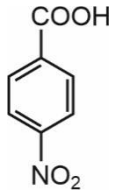
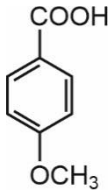
(B) NO_2 is an electron- withdrawing group which decreases electron- density on ring.

(C) 

is less acidic than 

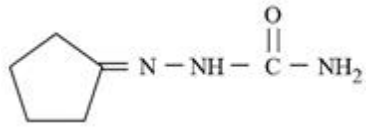
(D) Hyperconjugation is more in 

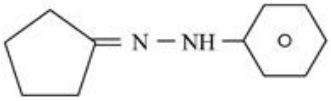
Answer (A)

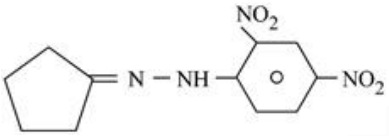
Sol.  is more acidic than  due to electron withdrawing nature of $-NO_2$ which decreases electron density on benzene ring.

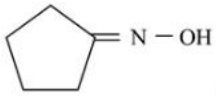
Question ID: 6926632

The structure representing semicarbazone of cyclopentanone correctly is:

(A) 

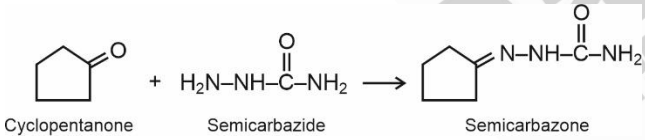
(B) 

(C) 

(D) 

Answer (A)

Sol.



Question ID: 6926633

Benzenediazonium chloride when heated with warm water, would produce

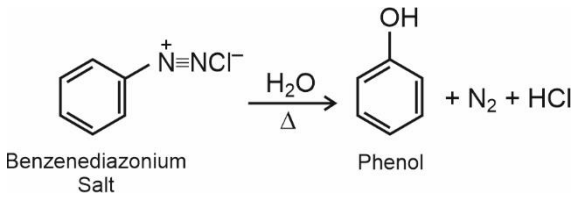
(A) benzene

(B) phenol

(C) chlorobenzene

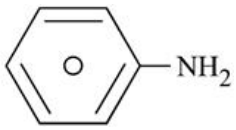
(D) aniline

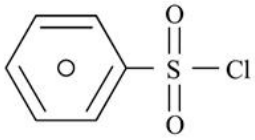
Answer (B)

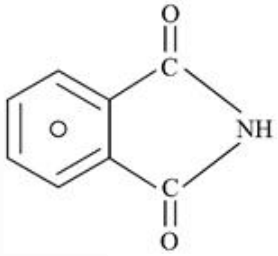
Sol. 

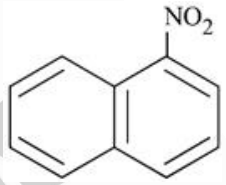
Question ID: 6926634

The reagent used in the Hinsberg test of primary, secondary and tertiary amines, is

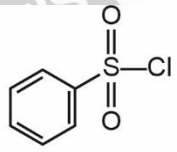
(A) 

(B) 

(C) 

(D) 

Answer (B)

Sol. 

Hinsberg reagent reacts with 1°, 2° and 3° amines to form sulphonamides.

Question ID: 6926635

Which of the following is an oligosaccaharide?

(A) Starch

(B) Glucose

(C) Ribose

(D) Maltose

Answer (D)

Sol. Oligosaccharides produces two to ten monosaccharide units.

So, maltose is an oligosaccharides which on hydrolysis gives two molecules of glucose.

Question ID: 6926636

During denaturation of proteins

(A) Secondary and tertiary structures remain intact

(B) Secondary and tertiary structures are destroyed

(C) Primary structures is destroyed

(D) Only tertiary structures remain intact

Answer (B)

Sol. During denaturation of proteins secondary and tertiary structures are destroyed but primary structure remains intact.

Question ID: 6926637

The polymer used as a substitute for wool is

(A) Polyether (B) Polyacrylonitrile

(C) Polyester (D) Teflon

Answer (B)

Sol. Polyacrylonitrile is used as a substitute for wool in making commercial fibre as orlon or acrilan.

Question ID: 6926638

Which of the following polymers involve cross linkages?

(A) Bakelite (B) PVC

(C) Nylon 6 (D) Novalac

Answer (A)

Sol. Bakelite is cross-linked or heavily branched polymer obtain by condensation of phenol and formaldehyde.

Question ID: 6926639

The tranquilizer used to control depression and hypertension is

(A) Equanil (B) Seldane

(C) Maprobamate (D) Asprin

Answer (A)

Sol. Equanil is used in controlling depression and hypertension.

Question ID: 6926640

Which of the following is not an antiseptic?

(A) 1% solution of phenol

(B) Tincture of Iodine

(C) Dettol

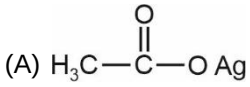
(D) Iodoform

Answer (A)

Sol. 1% solution of phenol is used as disinfectant.

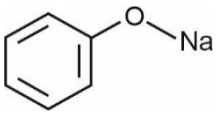
Question ID: 6926641

The organometallic compound from the following, is

(A) 

(B) $H_3CCOONa$

(C) H_3CMgBr

(D) 

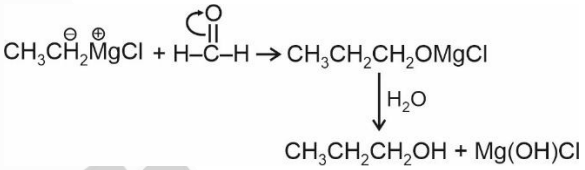
Answer (C)

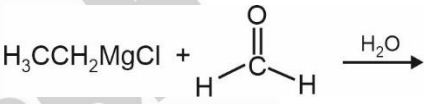
Sol. Compound in which carbon is directly linked to metal are known as organometallic compounds.

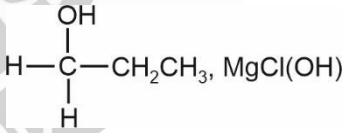
e.g. Grignard reagent : $CH_3–Mg–Br$

Question ID: 6926642

The products formed in the following reaction is





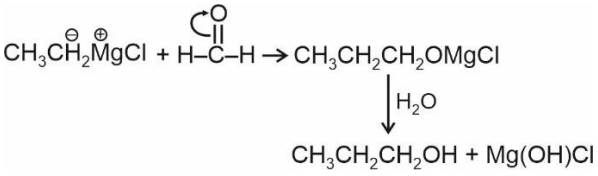
(A) 

(B) H_3CCH_2OH, HCOOH

(C) H_3CCH_3, MgCl(OH)

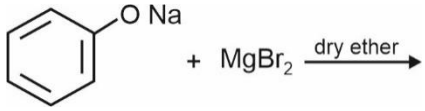
(D) $H_3CCH_2CH_3$, MgCl(OH)

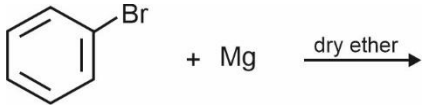
Answer (A)

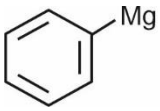
Sol. 

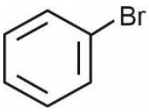
Question ID: 6926643

The correct equation from the following representing the preparation of phenyl magnesium bromide is

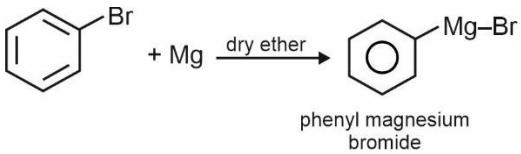
(A) 

(B) 

(C)  + Br_2 $\xrightarrow{\text{alcohol}}$

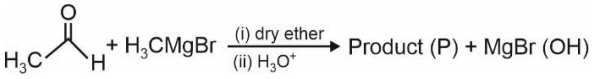
(D)  + $MgCl_2$ $\xrightarrow{\text{acetic acid}}$

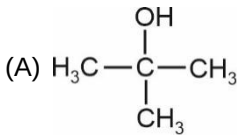
Answer (B)

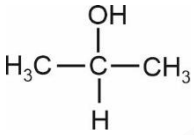
Sol. 

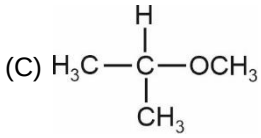
Question ID: 6926644

The product (P) formed in the following reaction is



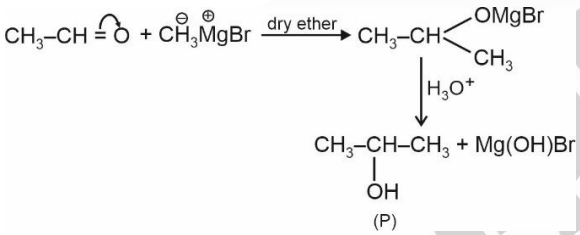
(A) 

(B) 

(C) 

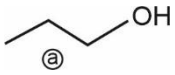
(D) H_3CCH_2COOH

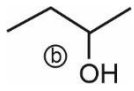
Answer (B)

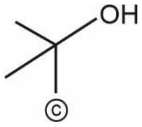
Sol. 

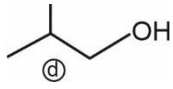
Question ID: 6926645

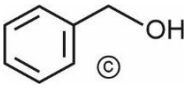
The number of alcohols which can be produced from Grignard reagent and formaldehyde from the following is

(1) 

(2) 

(3) 

(4) 

(5) 

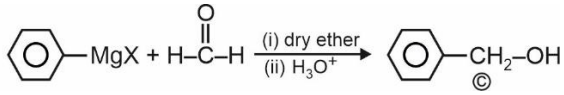
Choose the correct answer from the options given below.

(A) 5 (B) 2

(C) 4 (D) 3

Answer (D)

Sol.

- $CH_3CH_2MgX + H-\overset{O}{\overset{\|}{C}}-H \xrightarrow[(ii)\ H_3O^+]{\text{(i) dry ether}} CH_3CH_2CH_2OH$ ⓐ
- $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CHMgX + H-\overset{O}{\overset{\|}{C}}-H \xrightarrow[(ii)\ H_3O^+]{\text{(i) dry ether}} \begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-CH_2OH$ ⓓ
-  ⓒ

Grignard reagent an reaction with formaldehyde gives 1°- alcohol

Passage:

Read the passage give below to answer question

A potential difference developed between the electrode and electrolyte is called electrode potential. When the concentrations of all the species involved in a half cell is unity, then the electrode potential is known as standard electrode potential. In a galvanic cell, the half-cell in which oxidation takes place is called anode and it has a negative potential with respect to solution. The other half cell in which reduction takes place, is called cathode and it has a positive potential with respect to solution. Thus, there exists a potential difference between the two electrodes, cathode and anode. This difference is called cell potential and is measured in volts. It is called the cell electromotive force when no current is drawn through the cell. A galvanic cell is represented by putting a vertical line between metal and electrolyte solution and putting a double vertical line between the two electrolytes solution by salt bridge. Under this convention, emf of cell is positive and is given as $E_{cell} = E_{right} - E_{left}$

The standard electrode potential, are very important. The value at standard electrode potential of an electrode is greater than zero, then its reduced form is more stable compared to hydrogen gas. The value at some standard electrode potentials at 298 K are given below (ions are present as aqueous species and H_2O as liquid).

	ε^0 / V
$Ag^+ / Ag(s)$	0.80
$Cu^{2+} / Cu(s)$	0.34
$Pb^{2+} / Pb(s)$	–0.13

Fe^{2+} / Fe(s)	–0.44
Mg^{2+} / Mg(s)	–2.36

Questions ID : 6926646

The strongest oxidizing agent amongst the following Ag^+, Cu^{2+}, Fe^{2+}, Pb^{2+} is

(A) Ag^+ (B) Cu^{2+}

(C) Fe^{2+} (D) Pb^{2+}

Answer (A)

Sol. More the reduction potential, more will be the oxidising power of species.

$E^\circ_{RP}: Ag^+ > Cu^{2+} > Pb^{2+} > Fe^{2+} > Mg^{2+}$

Questions ID : 6926647

Amongst the following the weakest reducing agent is

(A) Mg (B) Pb

(C) Fe (D) Cu

Answer (D)

Sol. Lesser the oxidation potential of an species, lesser will be the reducing power.

$E^\circ_{OP}: Mg > Fe > Pb > Cu > Ag$

Questions ID : 6926648

The emf of the cell Ag(s) $|Ag^+(1m)||$ $Pb^{2+}(1m)|$ Pb(s), is

(A) 0.67 V (B) 1.06 V

(C) –0.93 V (D) 0.93 V

Answer (C)

Sol. $E^\circ_{Cell} - \frac{0.0591}{n}\log\left[\frac{P}{R}\right]$

$= \left(E^\circ_{Pb^{2+}/Pb} - E^\circ_{Ag^+/Ag}\right) - \frac{0.0591}{2}\log\left[\frac{[Ag^+]^2}{[Pb^{2+}]^1}\right]$

$= (-0.13) - (0.8) - \frac{0.0591}{2}\log(1)$

$= -0.93$ V

Questions ID : 6926649

When Pb is added to an aqueous solution of a mixture of Cu^{2+} and Mg^{2+} ions, it is

(A) Cu^{2+} is reduced

(B) Mg^{2+} is reduced

(C) Cu is reduced

(D) Pb^{2+} is reduced

Answer (A)

Sol. $E^\circ_{RP}: Cu^{2+} > Pb^{2+} > Mg^{2+}$

Since reduction potential of Cu is more than Pb, so Pb will reduce Cu^{2+} into Cu is

Questions ID : 6926650

The combination of electrodes which will give maximum value of E° cell at 298 K is

(A)	Anode	Cathode
	Ag	Mg
(B)	Anode	Cathode
	Cu	Fe
(C)	Anode	Cathode
	Mg	Ag
(D)	Anode	Cathode
	Pb	Mg

Answer (C)

Sol. (A) $E^\circ_{Cell} = E^\circ_{Mg^{2+}/Mg} - E^\circ_{Ag^+/Ag}$ = (–2.36) – (0.8) = –3.26 V

(B) $E^\circ_{Cell} = E^\circ_{Fe^{2+}/Fe} - E^\circ_{Cu^{2+}/Cu}$ = (–0.44) – (0.34) = –0.78 V

(C) $E^\circ_{Cell} = E^\circ_{Ag^+/Ag} - E^\circ_{Mg^{2+}/Mg}$ = (0.8) – (–2.36) = +3.16 V

(D) $E^\circ_{Cell} = E^\circ_{Mg^{2+}/Mg} - E^\circ_{Pb^{2+}/Pb}$ = (–2.36) – (–0.13) = –2.23 V

❑ ❑ ❑