

Aldehydes, Ketones and Carboxylic Acids JEE Main PYQ – 3

Total Time: 1 Hour

Total Marks: 100

Instructions

Instructions

1. Test will auto submit when the Time is up.
2. The Test comprises of multiple choice questions (MCQ) with one or more correct answers.
3. The clock in the top right corner will display the remaining time available for you to complete the examination.

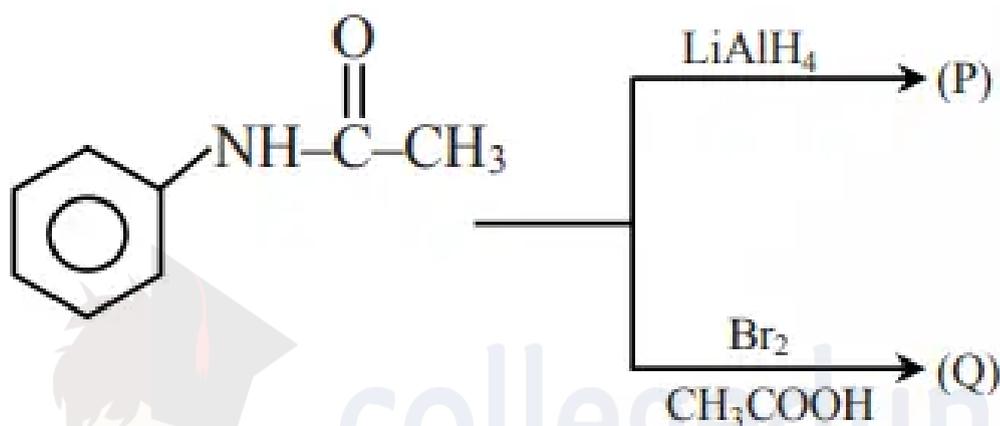
Navigating & Answering a Question

1. The answer will be saved automatically upon clicking on an option amongst the given choices of answer.
2. To deselect your chosen answer, click on the clear response button.
3. The marking scheme will be displayed for each question on the top right corner of the test window.

Aldehydes, Ketones and Carboxylic Acids

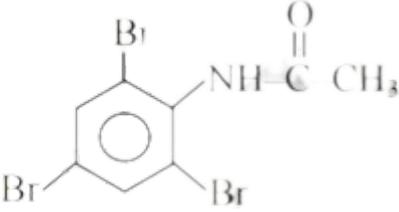
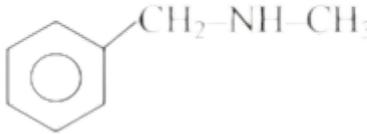
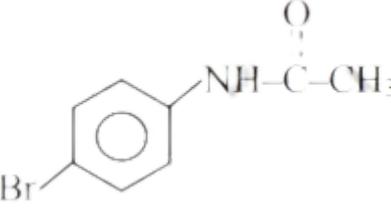
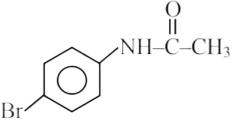
1. According to the adsorption theory of catalysis, the speed of the reaction increases because: (+4, -1)
- (A) Adsorption produces heat which increases the speed of the reaction
 - (B) Adsorption lowers the activation energy of the reaction
 - (C) The concentration of reactant molecules at the active centres of the catalyst becomes high due to adsorption
 - (D) Both (A) and (C)
-
2. The value of n in the molecular formula $Be_n Al_2 Si_6 O_{18}$ is: (+4, -1)
- (A) 2
 - (B) 4
 - (C) 6
 - (D) 3
-
3. Explain as to why haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reactions? (+4, -1)
- (A) Resonance effect
 - (B) C-Cl bond length
 - (C) (A) and (B) both
 - (D) None of the above
-
4. $P_A = (235y - 125xy)$ mm of Hg where P_A is partial pressure of A, x is mole fraction of B in liquid phase in the mixture of two liquids A and B and y is mole fraction of A in vapour phase, P° then in mm of Hg is: (+4, -1)

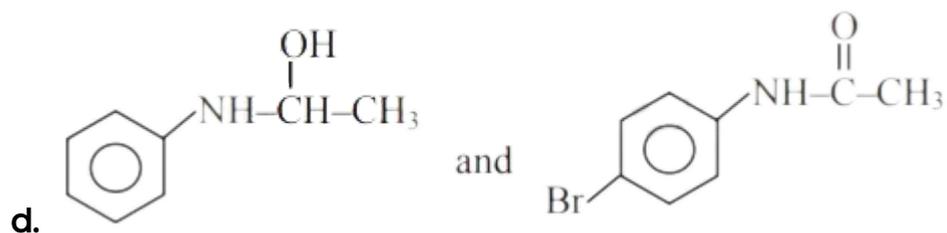
- a. (A) 235
- b. (B) 0
- c. (C) 125
- d. (D) 110



5. Product (P) and (Q) are respectively

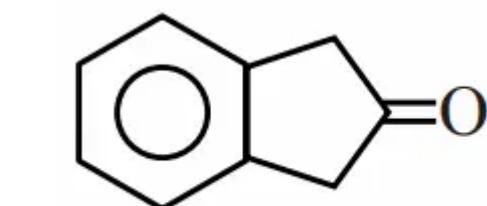
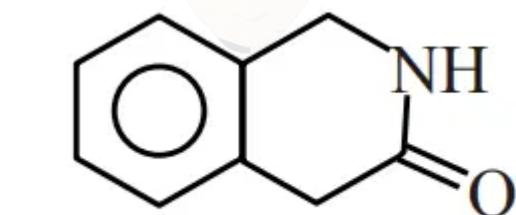
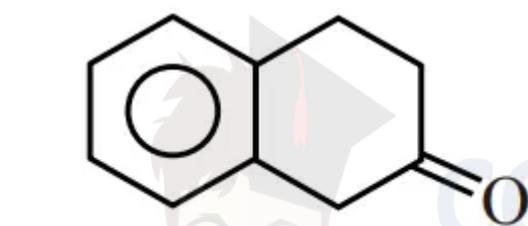
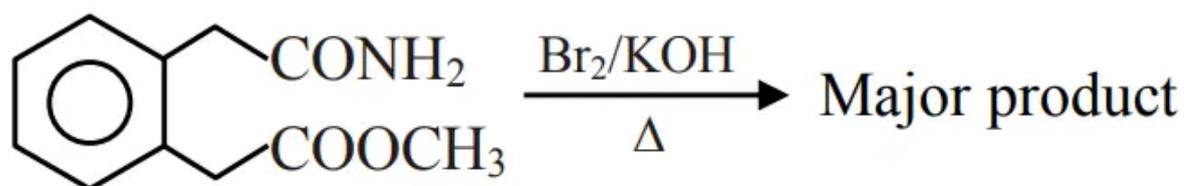
(+4, -1)

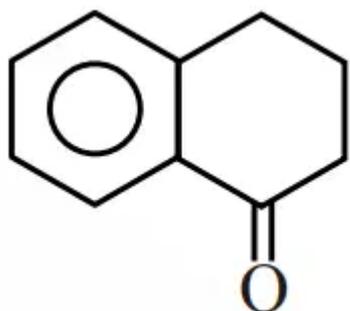
- a.  and 
- b.  and 
- c.  and 



6. Choose the correct option.

(+4, -1)

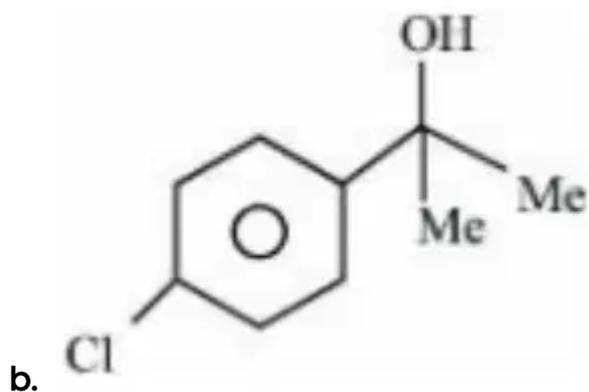
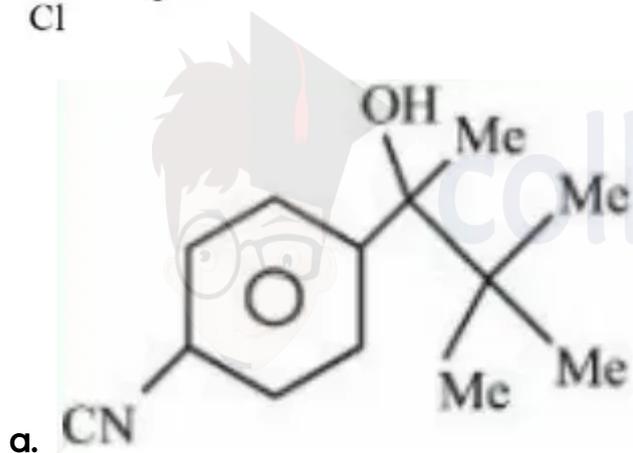
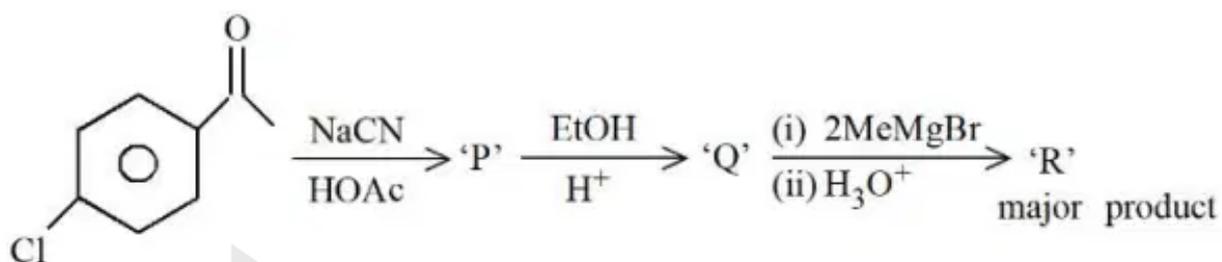


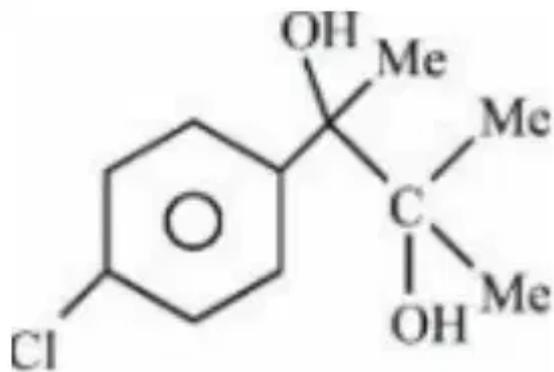


d.

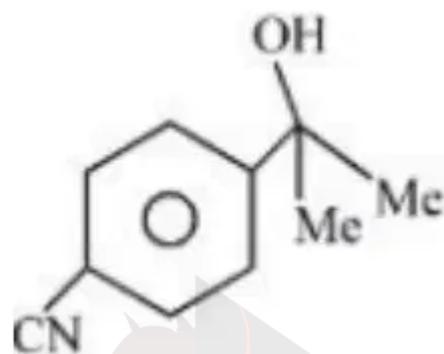
7. 'R' formed in the following sequence of reactions is :

(+4, -1)





c.

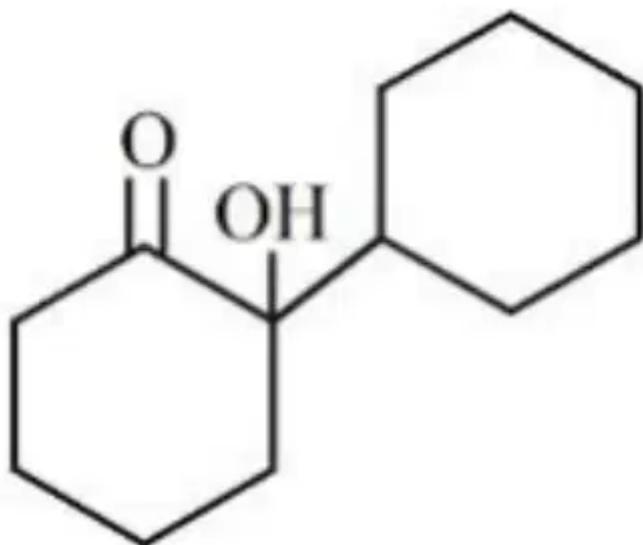


d.

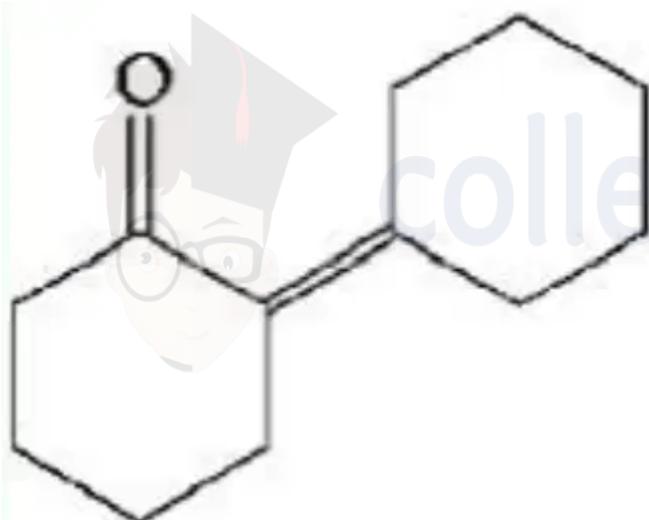
8. A hydrocarbon 'X' with formula C_6H_8 uses two moles of H_2 on catalytic hydrogenation of its one mole. On ozonolysis, 'X' yields two moles of methane dicarbaldehyde. The hydrocarbon 'X' is : (+4, -1)

- hexa-1, 3, 5-triene
- 1-methylcyclopenta-1, 4-diene
- cyclohexa - 1, 3-diene
- cyclohexa-1, 4-diene

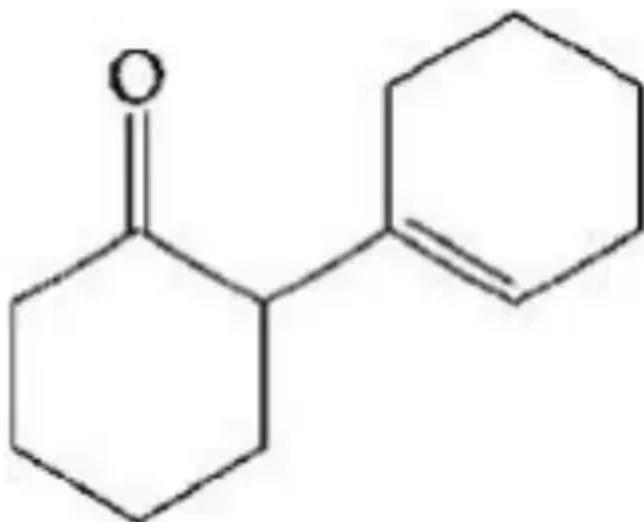
9. Cyclohexylamine when treated with nitrous acid yields (P). On treating (P) with PCC results in (Q). When (Q) is heated with dil. $NaOH$ we get (R). The final product (R) is : (+4, -1)



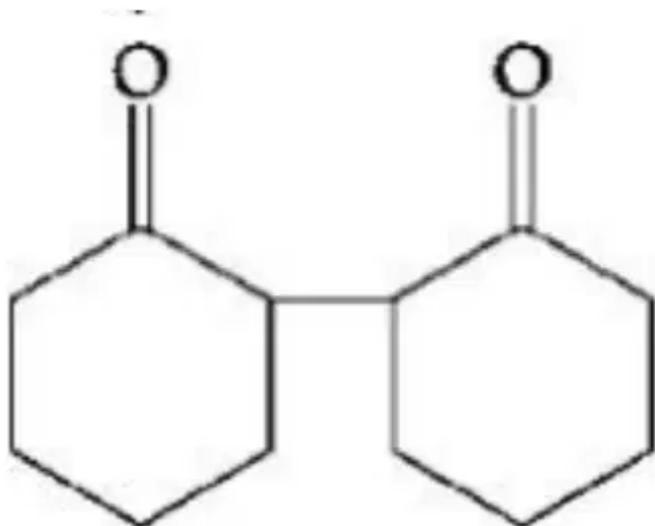
a.



b.



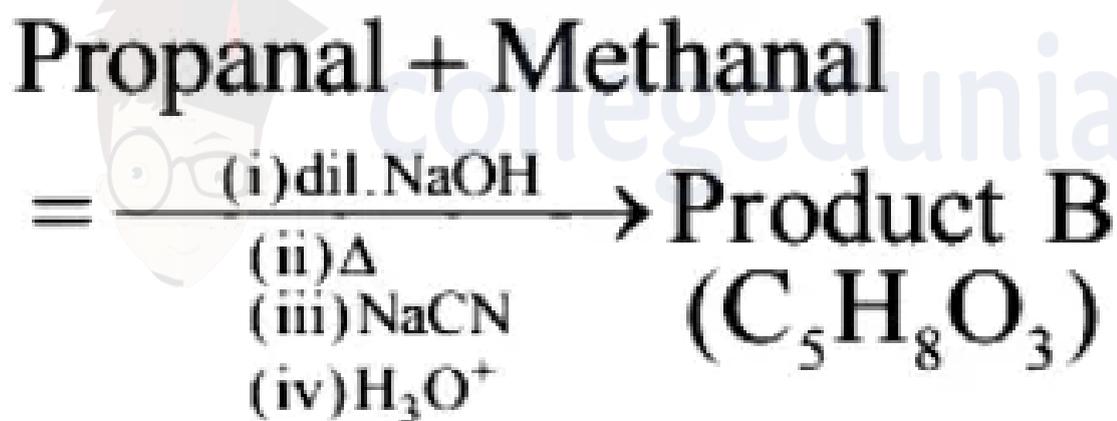
c.



d.

10. Consider the following reaction

(+4, -1)



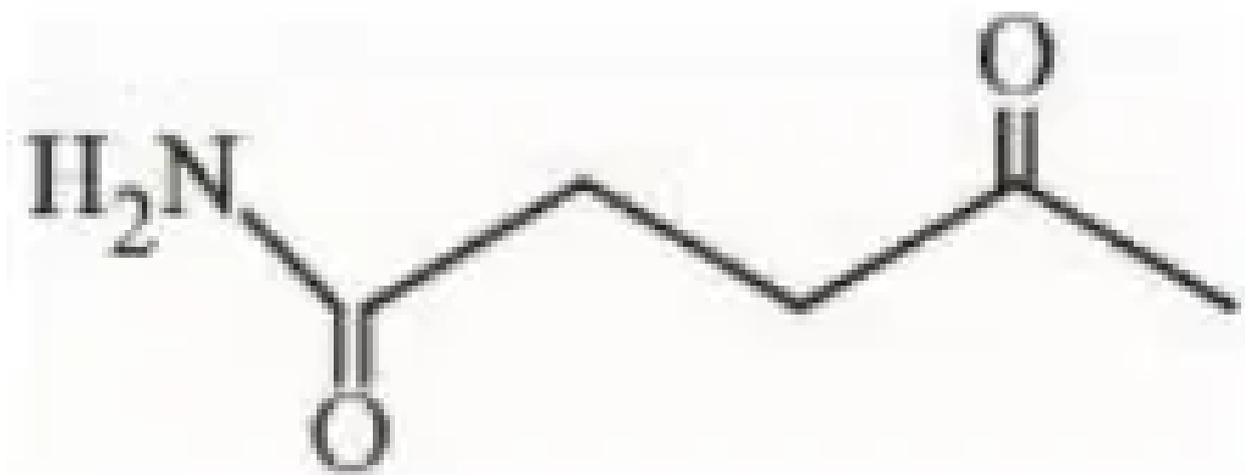
The correct statement for product *B* is It is

- a. optically active and adds one mole of bromine
- b. optically active alcohol and is neutral
- c. racemic mixture and gives a gas with saturated NaHCO_3 solution
- d. racemic mixture and is neutral

11. Given below are two statements:

(+4, -1)

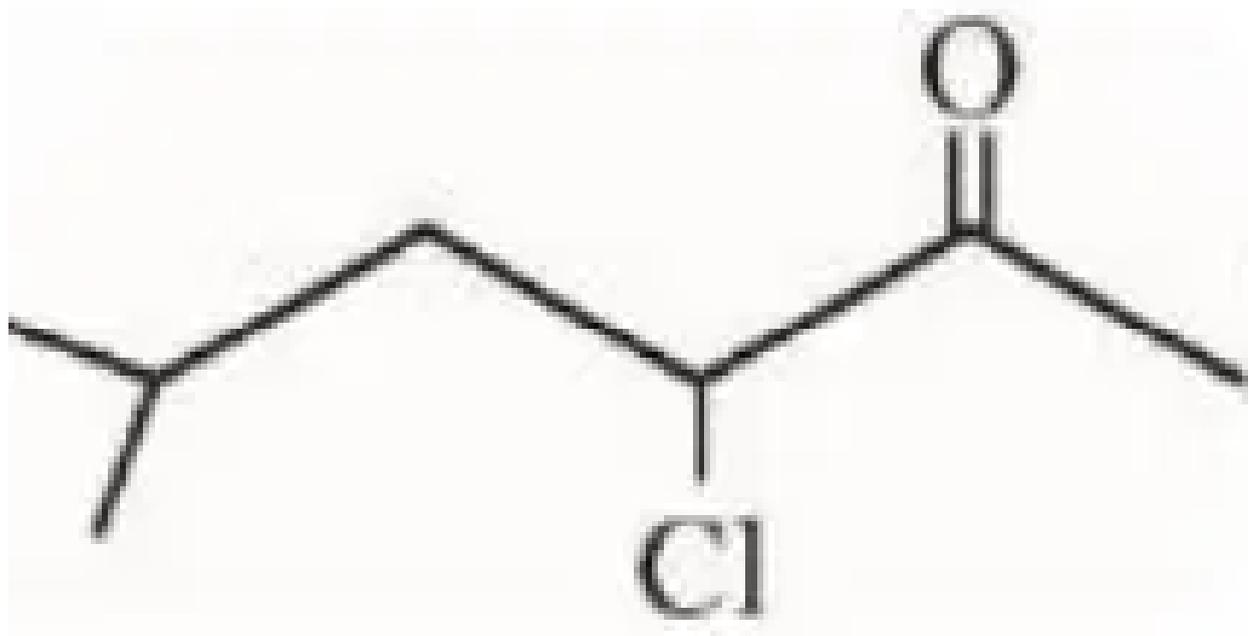
Statement I



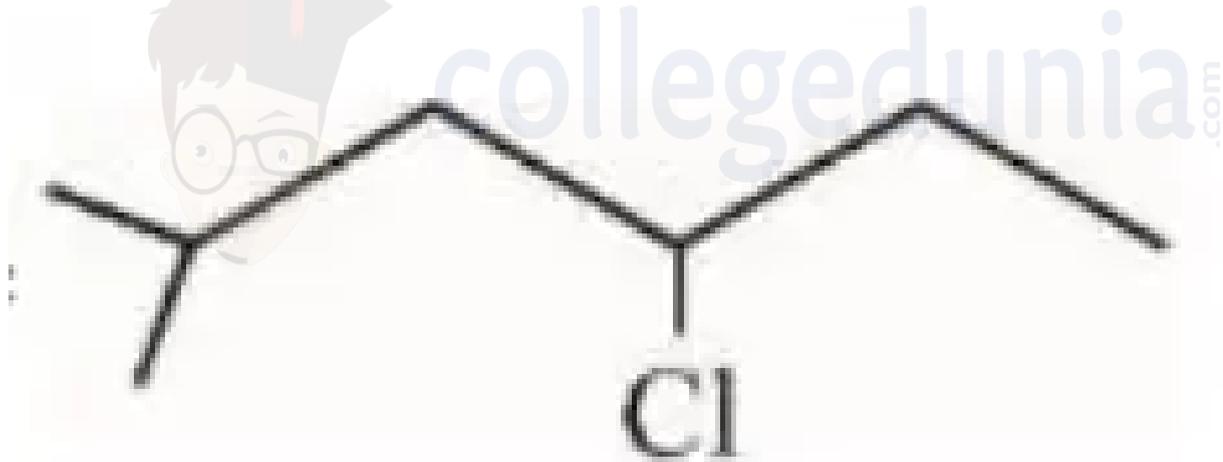
under Clemmensen reduction conditions will give



Statement II



under Wolff-Kishner reduction condition will give



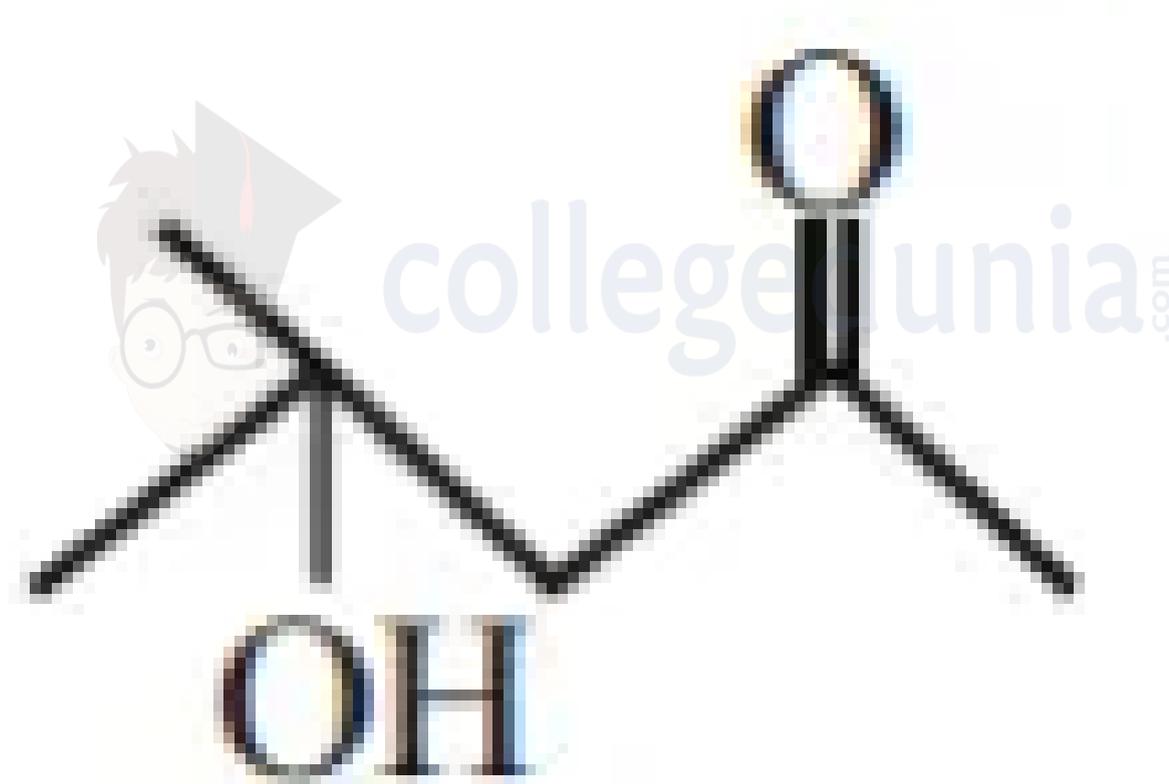
In the light of the above statements, choose the correct answer from the options given below:

- a. Statement I is true but Statement II is false
- b. Statement I is false but Statement II is true
- c. Both Statement I and Statement II are true
- d. Both Statement I and Statement II are false

12. A trisubstituted compound 'A', $C_{10}H_{12}O_2$, gives neutral $FeCl_3$ test positive. (+4, -1)
 Treatment of compound 'A' with $NaOH$ and CH_3Br gives $C_{11}H_{14}O_2$, with hydroiodic acid gives methyl iodide, and with hot conc. $NaOH$ gives a compound 'B', $C_{10}H_{10}O_2$. Compound 'A' also decolourises alkaline $KMnO_4$. The number of π -bond/s present in the compound 'A' is _____.

13. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R (+4, -1)

Assertion A :



can be easily reduced using $Zn - Hg/HCl$ to



Reason R : $Zn \cdot Hg/HCl$ is used to reduce carbonyl group to $-CH_2-$ group.

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

- a. A is false but R is true
- b. Both A and R are true but R is not the correct explanation of A
- c. A is true but R is false
- d. Both A and R are true and R is the correct explanation of A

14. The volume of hexagonal ice lattice is given by:

(+4, -1)

- a. (A) = 2^2
- b. (B) = 2^2
- c. (C) = $\frac{\sqrt{3}}{2}^2$
- d. (D) = $\frac{\sqrt{3}}{2}$

15. 1g of graphite is burnt in a bomb calorimeter in excess of oxygen at 298 K and 1 atmospheric pressure according to the equation: (graphite) + $\frac{1}{2}O_2(g) \rightarrow CO_2(g)$ During the reaction, temperature rises from 298 K to 299 K. If the heat capacity of the bomb calorimeter is 20.7 J/K, what is the enthalpy change for the above reaction at 298 K and 1 atm? (+4, -1)
- a. (A) $-2.48 \times 10^2 \text{ kJ mol}^{-1}$
- b. (B) $-3.48 \times 10^2 \text{ kJ mol}^{-1}$
- c. (C) $-4.48 \times 10^2 \text{ kJ mol}^{-1}$
- d. (D) $-5.48 \times 10^2 \text{ kJ mol}^{-1}$
-
16. One faraday of current was passed through the electrolytic cells placed in series containing solution of Ag^+ , Ni^{2+} and Cr^{3+} respectively. The ratio of amounts of Ag, Ni and Cr deposited will be: (At. Wt. of Ag = 108, Ni = 59, Cr = 52) (+4, -1)
- a. (A) 108:29.5:17.4
- b. (B) 17.4:29.5:108
- c. (C) 1:2:3
- d. (D) 108:59:52
-
17. When propionic acid is treated with aqueous sodium bicarbonate aqueous CO_2 is liberated. The C from CO_2 comes from: (+4, -1)
- a. (A) Methyl group
- b. (B) Carboxylic acid group
- c. (C) Methylene group
- d. (D) Bicarbonate

-
18. Amongst the following, the most basic compound is: (+4, -1)

- a. Benzylamine
- b. Aniline
- c. Acetanilide
- d. P-nitroaniline

19. Among the following four aromatic compounds, which one will have the lowest melting point? (+4, -1)

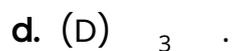
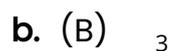
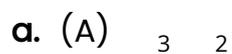
- a. (A)
- b. (B)
- c. (C)
- d. (D)



20. Among the following, the false statement is: (+4, -1)

- a. (A) Latex is a colloidal solution of rubber particles which are positively charged
- b. (B) Tyndall effect can be used to distinguish between a colloidal solution and a true solution
- c. (C) It is possible to cause artificial rain by throwing electrified sand carrying charge opposite to the one on clouds from an aeroplane
- d. (D) Lyophilic solution can be coagulated by adding an electrolyte

21. Which of the following compound is optically active? (+4, -1)



22. Tischenko reaction is a modification of : (+4, -1)

a. Aldol condensation

b. Claisen condensation

c. Cannizzaro reaction

d. Pinacol-pinacolon reaction

23. Monocarboxylic acids are functional isomers of: (+4, -1)

a. Ethers

b. Amines

c. Esters

d. Alcohols

24. Formaldehyde can be distinguished from acetaldehyde by the use of : (+4, -1)

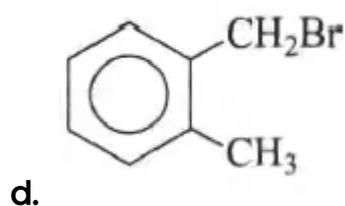
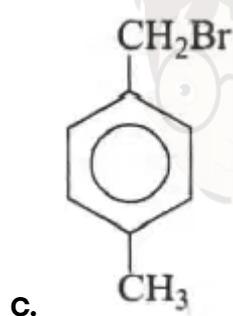
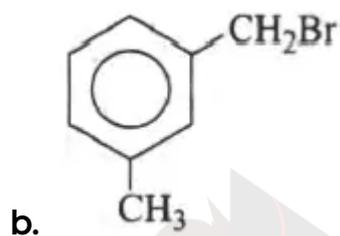
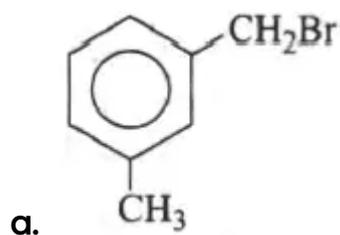
a. Schiff's reagent

b. Tollen's reagent

c. I_2/Alkali

d. Fehling's solution

25. Compound (A), C_8H_9Br gives a white precipitate when warmed with alcoholic $AgNO_3$. Oxidation of (A) gives an acid (B), $C_8H_6O_4$. (B) easily forms anhydride on heating. Identify the compound (A). (+4, -1)



Answers

1. Answer: d

Explanation:

Explanation:

According to the adsorption theory of catalysis, the speed of the reaction increases because adsorption is an exothermic process. The enthalpy of adsorption is utilized in weakening the bonds of the reactants and hence enhancing the speed of the reaction. Also, an increase in the concentration of the reactants on the surface of the catalyst increases the speed of the reaction. Hence, the correct option is (D).

2. Answer: d

Explanation:

Explanation:

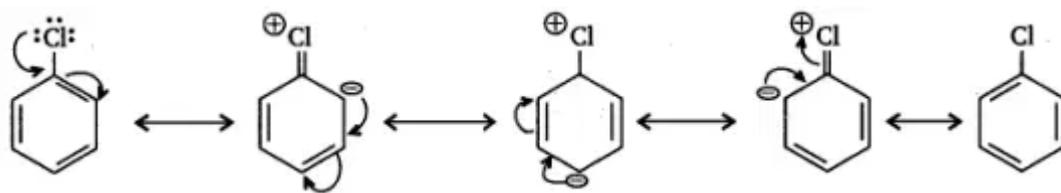
We have to find the value of n in $\text{Be}_n\text{Al}_2\text{Si}_6\text{O}_{18}$. $n = ?$
Charge on Al = +3
Charge on Si = +4
Charge on O = -2
Charge on Be = +2
 $n \times 2 + 2(+3) + 6(+4) + 18(-2) = 0$
 $n \times 2 + 6 + 24 - 36 = 0$
 $n \times 2 - 6 = 0$
 $n = 3$
Hence, the correct option is (D).

3. Answer: c

Explanation:

Explanation:

Haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reactions due to the following reasons:
1. Resonance effect: In haloarenes the electron pair on the halogen atom is in conjugation with the π - electrons of the ring and the following resonating structures are possible. C-Cl bond acquires a partial double bond character due to resonance. As a result, the bond cleavage in haloarenes is difficult than in case of haloalkanes and therefore they are less reactive towards nucleophilic substitution reactions.



2. The C-Cl bond length in haloalkanes is 177 pm while in haloarenes it is 169 pm. Since it is difficult to break shorter bond than a longer bond. Therefore, haloarenes are less reactive than haloalkanes towards nucleophilic substitution reactions. Hence, the correct option is (C).

4. Answer: d

Explanation:

Explanation:

Given: Partial pressure of A, $P_A = (235 - 125x) \text{ mm of Hg}$(i) $x = \text{Mole fraction of B in liquid phase} = \text{Mole fraction of A in vapour phase}$ We have to find P^0 in mm of Hg Now, according to Dalton's law of partial pressure : $P_A = \text{Mole fraction of component A in vapour phase} \times \text{Total vapour pressure}$(ii) Equation (i) can be written as: $A = (235 - 125x) y$(iii) From equations (i) and (iii), Total pressure, $p = 235 - 125x \dots$ (iv) Now, total pressure is given by: $p = P^0 + P^0 \dots$ (v) where $P^0 = \text{Vapour pressure of pure A}$ $P^0 = \text{Vapour pressure of pure B}$ = Mole fraction of A = Mole fraction of B Also, the sum of mole fractions of all the components in solution is always equal to one, i.e. $x + X_B = 1 - 1 = -X = 1 - x$ (As, mole fraction of component B is x) Substituting values in equation (v), we get $p = P^0(1 - x) + P^0 = P^0 - P^0x + P^0 = P^0 - (P^0 - P^0) \dots$ (vi) Comparing equations (iv) and (vi), we get $P^0 = 235$ And, $P^0 - P^0 = 125 P^0$ On substituting the value of P^0 we get, $235 - P^0 = 125 P^0 = 235 - 125 = 110 \text{ mm of Hg}$ Hence, the correct option is (D).

5. Answer: c

Explanation:

The correct answer is C

Concepts:

1. Aldehydes, Ketones, and Carboxylic Acids:

Aldehydes, Ketones, and Carboxylic Acids are *carbonyl compounds that contain a carbon-oxygen double bond*. These organic compounds are very important in the field of organic chemistry and also have many industrial applications.

Aldehydes:

Aldehydes are organic compounds that have the functional group -CHO .

Preparation of Aldehydes

Acid chlorides are reduced to aldehydes with **hydrogen** in the presence of palladium catalyst spread on barium sulfate.

Ketones:

Ketones are organic compounds that have the functional group C=O and the structure R-(C=O)-R' .

Preparation of Ketones

Acid chlorides on reaction with dialkyl cadmium produce ketones. Dialkyl cadmium themselves are prepared from Grignard reagents.

Carboxylic Acid:

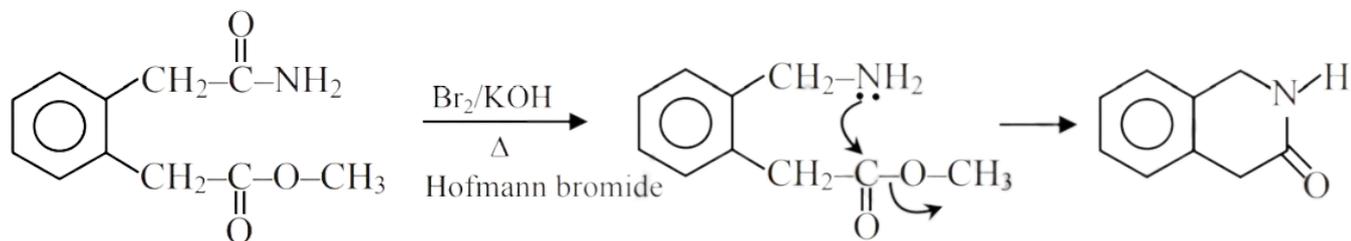
Carboxylic acids are organic compounds that contain a (C=O)OH group attached to an R group (where R refers to the remaining part of the molecule).

Preparation of Carboxylic Acids

Primary alcohols are readily oxidized to carboxylic acids with common oxidizing agents such as potassium permanganate in neutral acidic or alkaline media or by potassium dichromate and chromium trioxide in acidic media.

6. Answer: b

Explanation:



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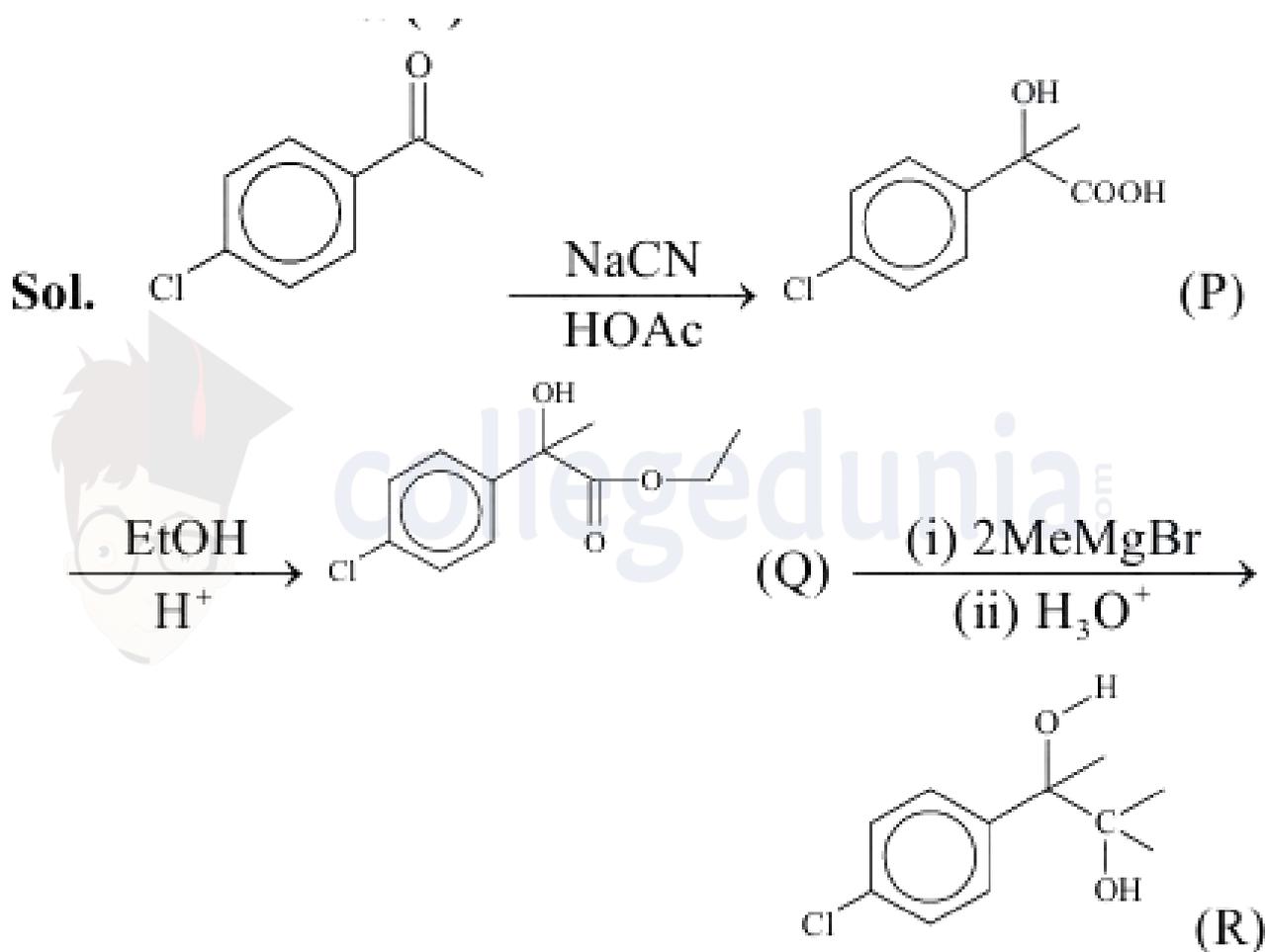
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7. Answer: a

Explanation:



The reaction sequence involves multiple steps:

Step 1: Cyanohydrin Formation (Intermediate P) - The aldehyde group ($-\text{CHO}$) in chlorobenzaldehyde reacts with NaCN in the presence of HOAc , leading to the formation of a cyanohydrin intermediate. - Cyanohydrin structure (P): $\text{C}_6\text{H}_4(\text{Cl})(\text{CHOH})(\text{CN})$.

Step 2: Hydrolysis of Cyanohydrin (Intermediate Q) - The cyanohydrin (P) undergoes hydrolysis with ethanol and acidic conditions (EtOH, H^+) to produce a β -hydroxy ketone intermediate (Q). - Structure of (Q): $\text{C}_6\text{H}_4(\text{Cl})(\text{COCH}_2\text{OH})$.

Step 3: Grignard Reaction (Formation of Final Product R) – The intermediate (*Q*) reacts with methyl magnesium bromide (2MeMgBr) to add two $-\text{Me}$ groups to the carbonyl carbon, forming a tertiary alcohol. – This is followed by hydrolysis with H_3O^+ , leading to the final product *R*. – Structure of *R*: $\text{C}_6\text{H}_4(\text{Cl})(\text{CN})(\text{OH})$ with $-\text{Me}$, $-\text{Me}$ groups on the same carbon as the hydroxyl group.

Conclusion: The correct product *R* matches Option (1).

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Carboxylic Acid:

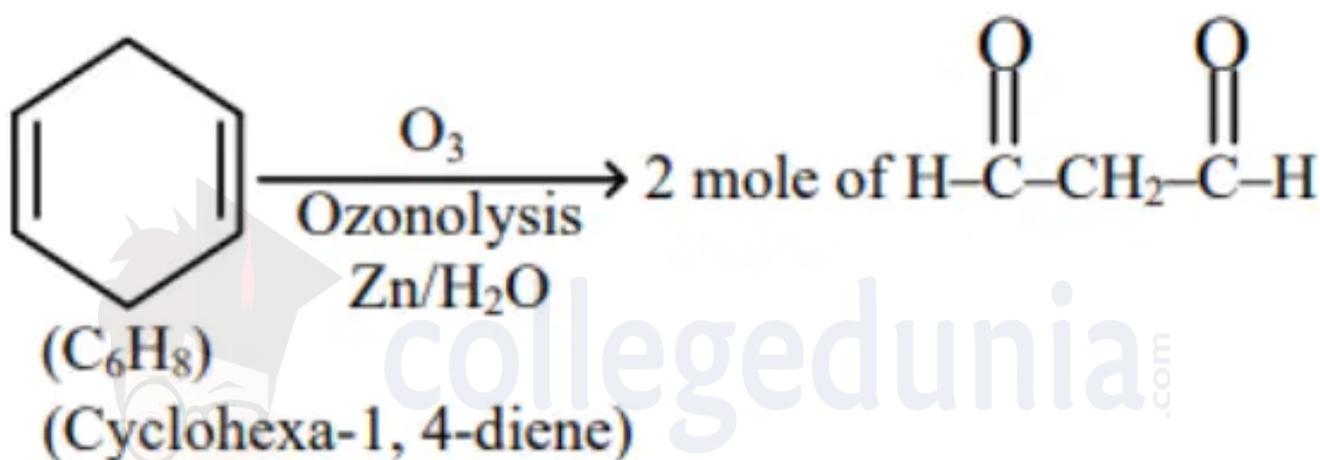
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8. Answer: d

Explanation:



so, the correct option is (D) : cyclohexa-1, 4-diene

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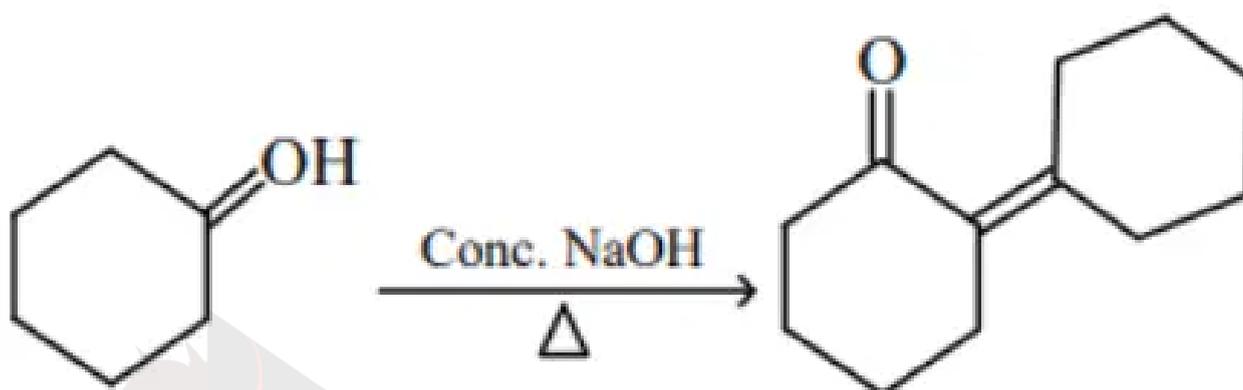
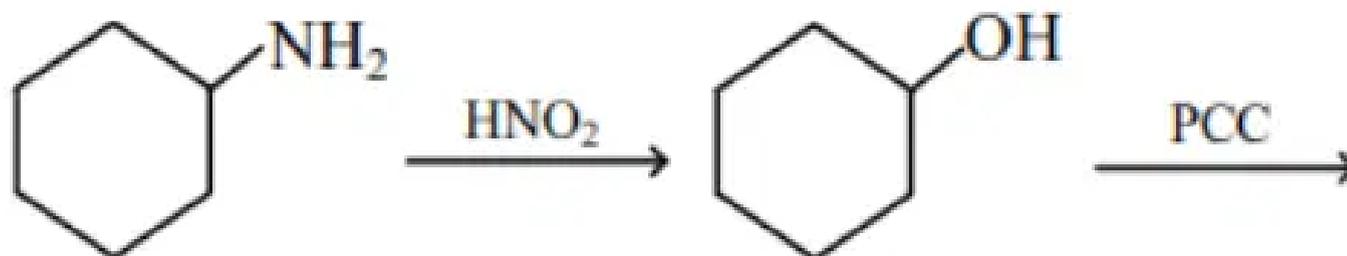
Carboxylic acids are organic compounds that contain a $(C=O)OH$ group attached to an R group (where R refers to the remaining part of the molecule).

Preparation of Carboxylic Acids

Primary alcohols are readily oxidized to carboxylic acids with common oxidizing agents such as potassium permanganate in neutral acidic or alkaline media or by potassium dichromate and chromium trioxide in acidic media.

9. Answer: b

Explanation:



So, the correct option is (B).

Concepts:

1. Aldehydes, Ketones, and Carboxylic Acids:

Aldehydes, Ketones, and Carboxylic Acids are *carbonyl compounds that contain a carbon-oxygen double bond*. These organic compounds are very important in the field of organic chemistry and also have many industrial applications.

Aldehydes:

Aldehydes are organic compounds that have the functional group -CHO.

Preparation of Aldehydes

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Ketones:

Ketones are organic compounds that have the functional group $C=O$ and the structure $R-(C=O)-R'$.

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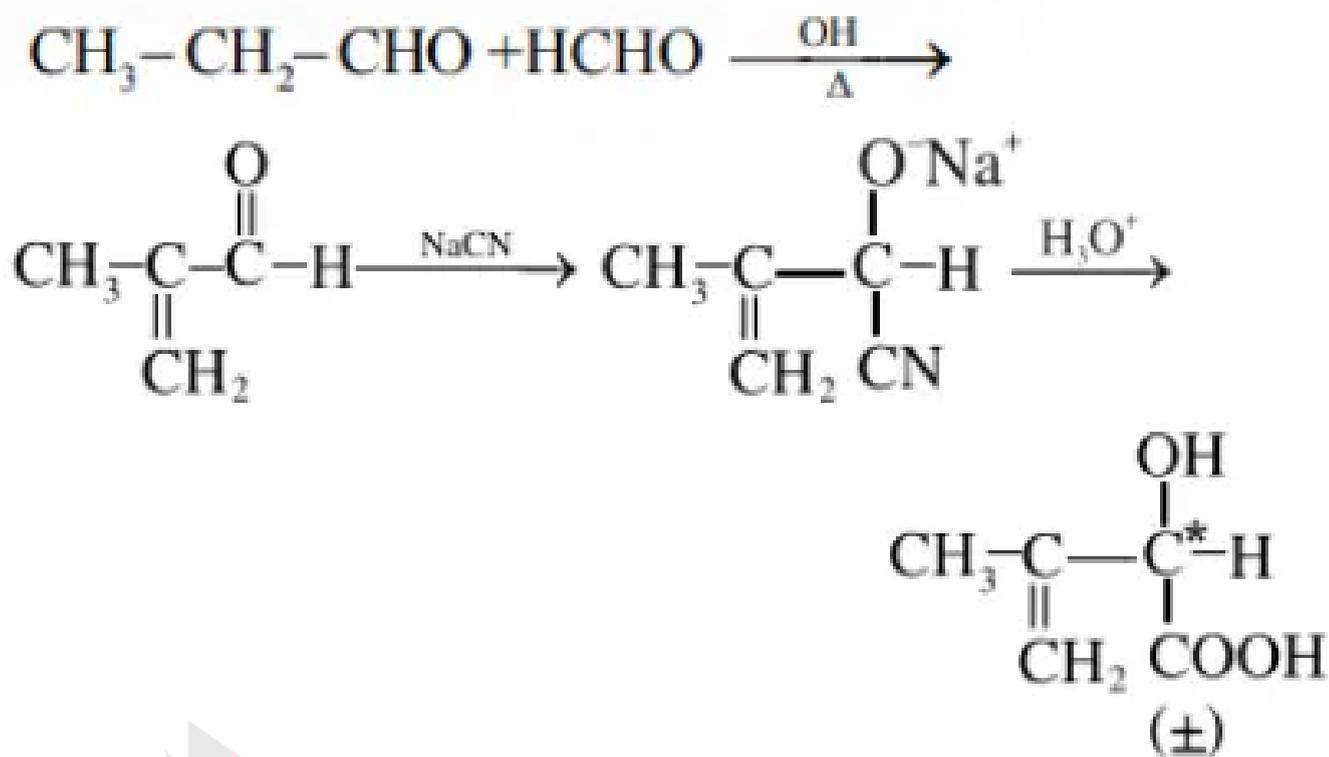
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10. Answer: c

Explanation:



Carboxylic acid will give CO_2 gas, with NaHCO_3 solution

kk

So, the correct option is (C): racemic mixture and gives a gas with saturated NaHCO_3 solution

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11. Answer: a

Explanation:

Statement I:

Clemmensen reduction involves the use of $Zn(Hg)$ and HCl , which reduces ketones or aldehydes to their corresponding alkanes under acidic conditions.

In the given compound, $H_2N - CH_2CH_2COCH_3$, the ketone group ($COCH_3$) is reduced, and the intermediate carboxylic acid product ($HOOC-CH_2CH_2$) is correct under these conditions.

Hence, Statement I is true.

Statement II:

Wolff-Kishner reduction involves hydrazine (NH_2NH_2) and a strong base such as KOH , which reduces carbonyl groups (ketones or aldehydes) to their corresponding alkanes.

However, in the compound $\text{Cl-CH}_2\text{CH}_2\text{COCH}_3$, the chlorine atom may react with the basic medium, leading to a side reaction (dehydrohalogenation) instead of simple reduction. The final product will not necessarily be $\text{ClCH}_2\text{CH}_2\text{CH}_3$, as suggested.

Hence, Statement II is false.

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12. Answer: 4 - 4

Explanation:

Step 1: Analyze the Structure of Compound 'A'

Given the molecular formula $C_{10}H_{12}O_2$, compound 'A' gives a positive neutral $FeCl_3$ test, indicating the presence of a phenolic ($-OH$) group. Compound 'A' also decolourises alkaline $KMnO_4$, indicating the presence of a double bond.

Step 2: Chemical Reactions of 'A'

- Treatment with $NaOH$ and CH_3Br forms $C_{11}H_{14}O_2$, confirming the presence of a second hydroxyl group.
- Hydroiodic acid treatment yields methyl iodide, confirming the presence of an ether bond ($-OCH_3$).
- Hot $NaOH$ treatment forms compound 'B', $C_{10}H_{10}O_2$, which retains a double bond.

Step 3: Determine the Number of π Bonds

The structure of compound 'A' contains:

One aromatic benzene ring with three π bonds.

One aliphatic double bond outside the aromatic ring.

Thus, the total number of π bonds in compound 'A' is:

$$\text{Number of } \pi \text{ bonds} = 3 \text{ (aromatic)} + 1 \text{ (aliphatic)} = 4.$$

Conclusion:

The number of π bonds present in compound 'A' is 4.

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13. Answer: a

Explanation:

The correct answer is (A) : A is false but R is true



The acid sensitive alcohol group reacts with HCl , hence Clemmenson reduction is not suitable for above conversion.

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Explanation:

Explanation:

Hexagonal ice lattice belongs to the hexagonal crystal system. It has hexagonal symmetry. In a hexagonal crystal system, $a = b \neq c$ and $\alpha = \beta = 90^\circ \neq 120^\circ$ where, a, b, c are the axial distances and α, β, γ are the axial angles. It can be shown as: The base area of the unit cell of HCP: It is equal to the area of six equilateral

triangles each with side $2r$ and altitude. $\sin = \frac{\text{Perpendicular}}{\text{Hypotenuse}} = \frac{CD}{2r}$
 $\sin 60^\circ = \frac{\sqrt{3}}{2}$
 $CD = \frac{\text{perpendicular}}{\text{altitude}} = 2r \times \sin 60^\circ = 2r \times \frac{\sqrt{3}}{2} = \sqrt{3}r$ Base area
 $= 6 \times \frac{1}{2} (2r)^2 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}r^2$ (i) Height of unit cell of HCP = c Now, The volume of a unit cell of HCP = Base area \times Height (c) (ii) On substituting the values from equation (i) to equation (ii), we get The volume of the unit cell (V) = $6\sqrt{3}r^2 \times c$ (iii) Now, we know that, $c = \frac{4}{3}r$ Substituting the value of r in equation (iii), we get

$$= 6\sqrt{3} \times \left(\frac{2}{3}\right)^2 \times \frac{4}{3} = 6\sqrt{3} \times \frac{2}{4} \times \frac{4}{3} = \frac{\sqrt{3}}{2} \times 2^2$$

Hence, the correct option is (C).

15. Answer: a

Explanation:

Explanation:

Suppose Q is the quantity of heat from the reaction mixture and C is the heat capacity of the calorimeter, then the quantity of heat absorbed by the calorimeter. $Q = C \times \Delta T$ The quantity of heat from the reaction will have the same magnitude but opposite sign because the heat lost by the system (reaction mixture) is equal to the heat gained by the calorimeter. $Q = -C \times \Delta T = -20.7 \text{ kJ/K} \times (299 - 298) \text{K} = -20.7$ (Here, a negative sign indicates the exothermic nature of the reaction.) Thus, ΔH for the combustion of the 1 g of graphite = $-20.7 \text{ kJ mol}^{-1}$ For combustion of 1 mol of graphite. $= \frac{12.0 \text{ mol}^{-1} \times (-20.7 \text{ kJ})}{1} = -2.48 \times 10^2 \text{ mol}^{-1}$, Since $\Delta H = 0$.
 $\Delta H = \Delta H = -2.48 \times 10^2 \text{ mol}^{-1}$ Hence, the correct option is (A).

16. Answer: a

Explanation:

Explanation:

For deposition of Ag, reaction is $\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$ Thus, 1 F deposits Ag = 1 mol = 108 g
For deposition of Ni, the reaction is $\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni}$ Thus, 2 F deposits Ni = 1 mol = 59 g
1 F deposits Ni = 0.5 mol = 29.5 g
For deposition of Cr, the reaction is $\text{Cr}^{3+} + 3\text{e}^- \rightarrow \text{Cr}$ Thus, 3 F deposits Cr = 1 mol
1 F deposits Cr = 0.33 mol = 17.4 g
Hence, the correct option is (A).

17. Answer: d

Explanation:

Explanation:

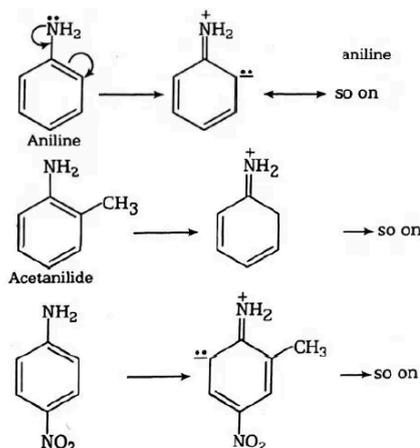
We know that carboxylic acids reacting with aqueous sodium bicarbonate form sodium salt of carboxylic acid, carbonic acid which is unstable which further forms carbon dioxide and a water molecule. Now coming to the given question we will carry out the given reaction. We will carry out the reaction between propionic acid and aqueous sodium bicarbonate. The reaction will be as follows:

$\text{C}_2\text{H}_5\text{COOH} + \text{NaHCO}_3 \rightarrow \text{C}_2\text{H}_5\text{COONa} + \text{H}_2\text{O} + \text{CO}_2$ Here the formation of water takes place by taking one hydrogen from propionic acid, one from sodium bicarbonate, and one oxygen from sodium bicarbonate. The remaining carbon dioxide is formed from bicarbonate. So the C of CO_2 comes from bicarbonate. Hence, the correct option is (D).

18. Answer: a

Explanation:

The lone pair of nitrogen in benzylamine ($\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$) is not involved in delocalization and remains available for donation. However, in the other compounds provided, the lone pair of nitrogen participates in delocalization, rendering them unavailable for donation, as depicted below.



The most basic compound among the given compounds is benzylamine.

19. Answer: a

Explanation:

Explanation:

Given compounds are:



We have to find the compound which has the lowest melting point. We know that, greater the intermolecular forces of attractions, greater is the melting point of the substance. Polarity is directly proportional to intermolecular forces of attraction. Non-polar compounds have weak van der Waals' forces of attraction. Naphthalene (compound A) is a non-polar compound thus, it will have lowest melting point. All other three compounds are polar having

present in them which are polar groups. Hence, the correct option is (A).

20. Answer: a

Explanation:

Explanation:

A. Latex is a colloidal solution of rubber particles which are negatively charged, not positively charged. Rubber is obtained by coagulation of latex. B. Tyndall effect can

be used to distinguished between a colloidal solution and a true solution . Tyndall effect is shown by colloidal solution while true solution does not show Tyndall effect.C. It is possible to cause artificial rain by throwing electrified sand carrying charge opposite to the one on clouds from an aeroplane. This is because clouds are aerosols having small droplets of water suspended in it and has some charge. On spraying electrified sand carrying opposite charge to the one on clouds results in coagulation of water particles which leads to rain.D. Lyophilic solution can be coagulated by adding on electrolyte in large quantities because of hydration of colloidal particles in lyophilic solution.Hence, the correct option is (A).

21. Answer: b

Explanation:

Explanation:

$\text{CH}_3\text{CH}_2\text{COOH}$ compound is optically active.Propanoic acid has the following structure:

On evaluating the structure, we see that there is no chiral carbon atom present. Therefore, propanoic acid is not optically active.When we observe the structure of lactic acid, we see that it is attached to four different functional groups and has a chiral carbon.Also, there are no elements of symmetry, so Lactic acid shows optical activity. It is present as D and L isomers.



Malonic acid is symmetrical and thus not chiral.



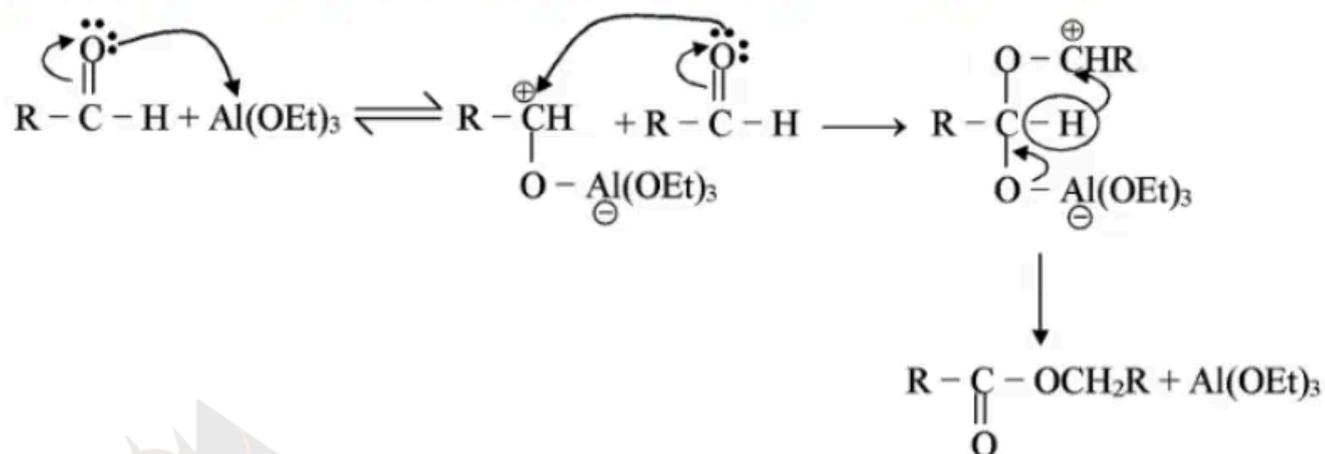
$\text{CH}_3\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{CH}_3$ also does not have any chiral carbon atom, so it is not chiral.Hence, the correct option is (B).

22. Answer: c

Explanation:

Tischenko reaction is a modification of Cannizzaro reaction. The Tishchenko reaction is an organic chemical reaction that involves disproportionation of an aldehyde lacking a hydrogen atom in the alpha position in the presence of an alkoxide. The Tishchenko Reaction is a disproportionation reaction that allows the preparation of esters from two equivalents of an aldehyde. The reaction product is an ester.

Reaction Mechanism of Tischenko reaction



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Preparation of Carboxylic Acids

Primary alcohols are readily oxidized to carboxylic acids with common oxidizing agents such as potassium permanganate in neutral acidic or alkaline media or by potassium dichromate and chromium trioxide in acidic media.

23. Answer: c

Explanation:

Mono-carboxylic acids are functional isomers of esters, e.g., CH_3COOH
Acetic acid

$HCOOCH_3$
Methyl formate

Concepts:

1. Plant Growth and Development:

Growth in Plants:

Plants have the distinctive ability to grow throughout their life. The meristem cells present there in the [roots](#) and shoot apical lead to the primary growth of the plant. The primary growth which happens or takes place at the tips of the stem and roots of the plant contributes to the elongation of the plant along its axis.

In the later stages of growth in plants, the growth in dicotyledonous, [vascular cambium](#), [gymnosperms](#), and cork-cambium are also caused by the existence of meristems in them. These intercalary meristems are put up to increase the girth of the organs of the plant in which they are active. Such type of growth is commonly known as secondary growth.

Many parameters such as area, volume, fresh weight, cell number, dry weight, length, etc are utilized to measure the growth in plants as increase in the amount of protoplasm is responsible for the growth in plants.

Read More: [Plant Growth and Development](#)

24. Answer: c

Explanation:

Only acetaldehyde and methyl ketones give iodoform test.

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25. Answer: d

Explanation:

Compound A gives a precipitate with alcoholic $AgNO_3$, so it must contain Br in side chain. On oxidation, it gives $C_8H_6O_4$, which shows the presence of two alkyl chains attached directly with the benzene nucleus. Since, compound B gives anhydride on heating, the two alkyl substituents must occupy adjacent (1, 2) position. Thus, A must be

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