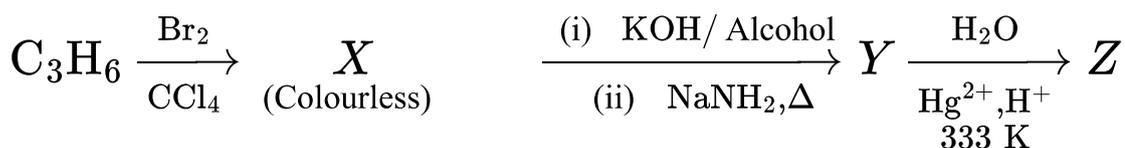


Aldehyde and Ketone

Question1

What is ' Z ' in the following reaction sequence?



AP EAPCET 2025 - 26th May Morning Shift

Options:

A.

Acetone

B.

Propanal

C.

2-Propanol

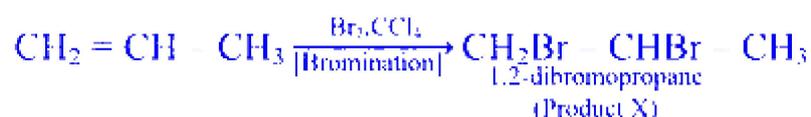
D.

Methoxy ethane

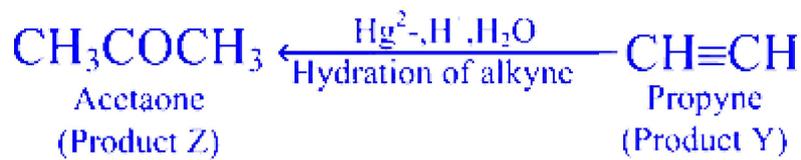
Answer: A

Solution:

The complete reaction,

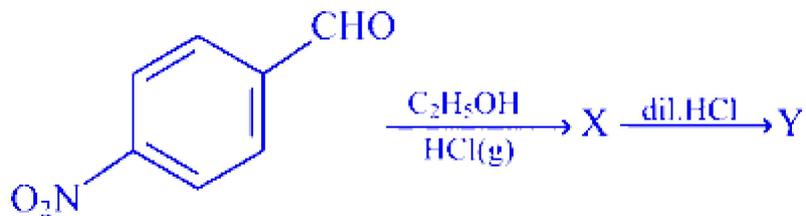


Alcohol /KOH, Δ NaNH₂ ↓ Double elimination



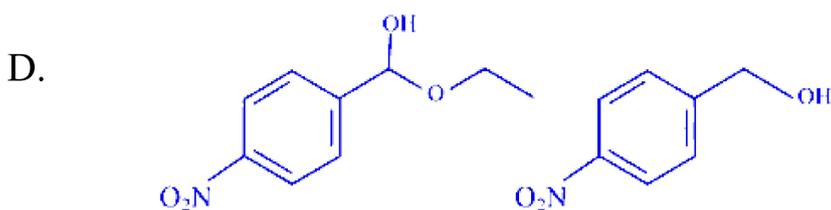
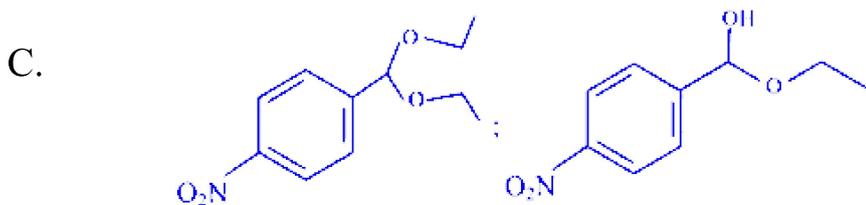
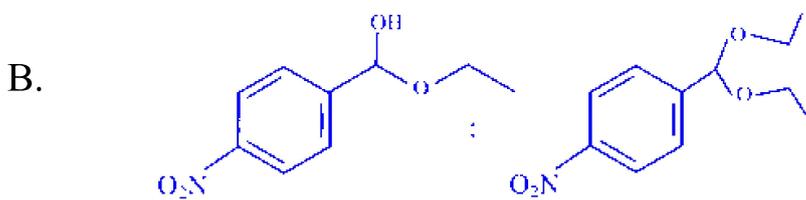
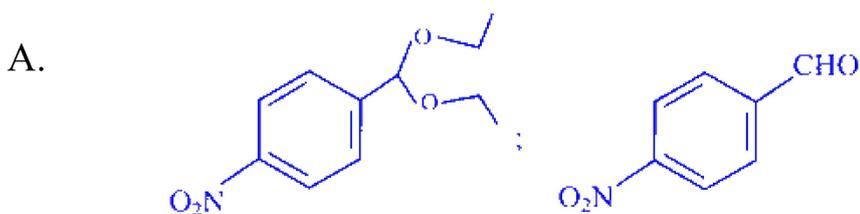
Question2

What are *X* and *Y* respectively in the following reaction sequence?



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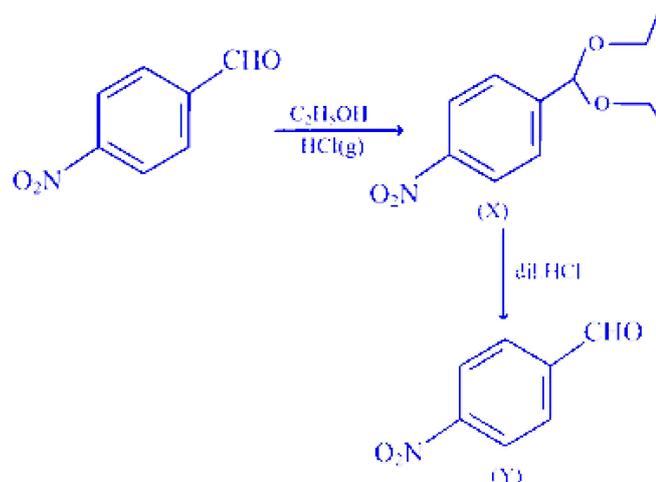
Options:



Answer: A

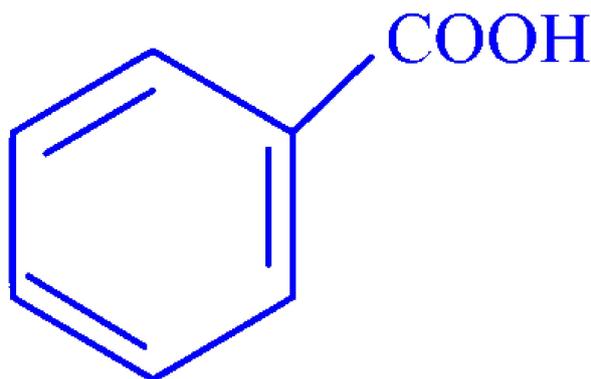
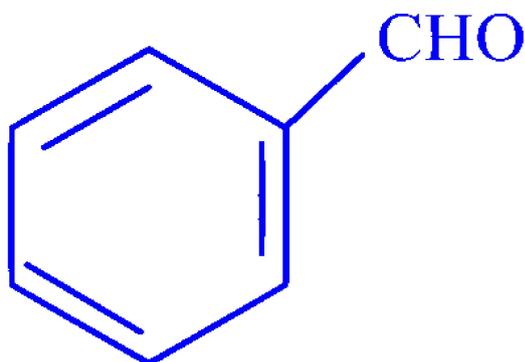
Solution:

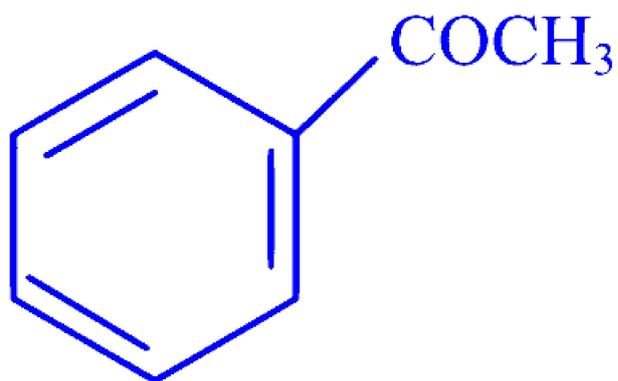
The complete reaction sequence is as follows



Question3

Arrange the following in decreasing order of electrophilicity of carbonyl carbon.





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Options:

A.

IV > I > III > II

B.

IV > I > II > III

C.

I > IV > III > II

D.

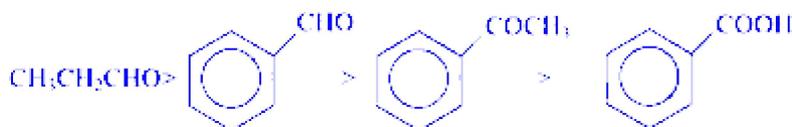
I > II > IV > III



Answer: A

Solution:

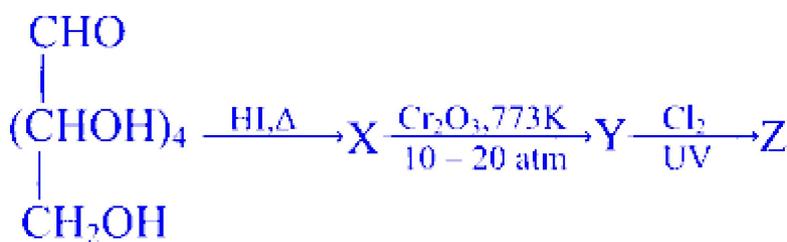
The electrophilicity of carbonyl carbon is increased by electron withdrawing group while it is decreased by electron donating group. Thus the correct decreasing order of electrophilicity of carbonyl carbon is



i.e. IV > I > III > II

Question4

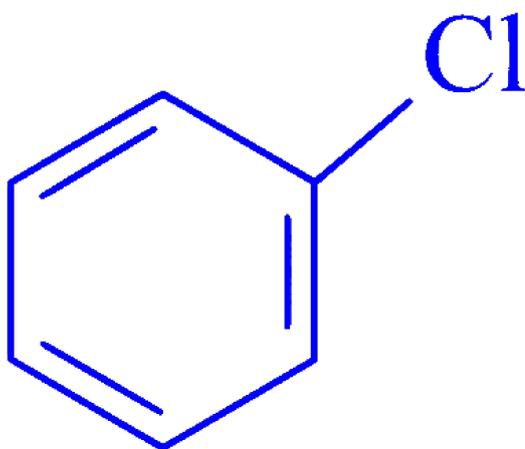
The structure of the product ' Z ' in the reaction sequence is



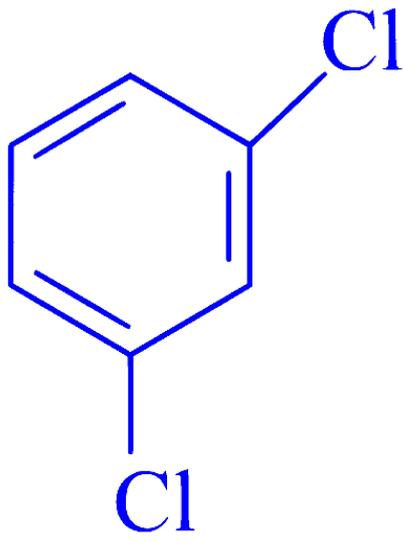
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Options:

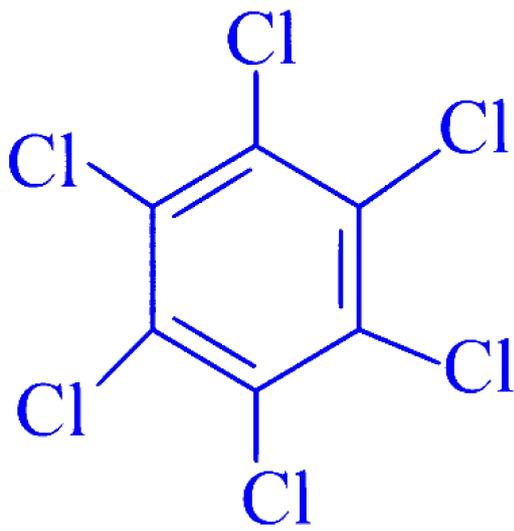
A.



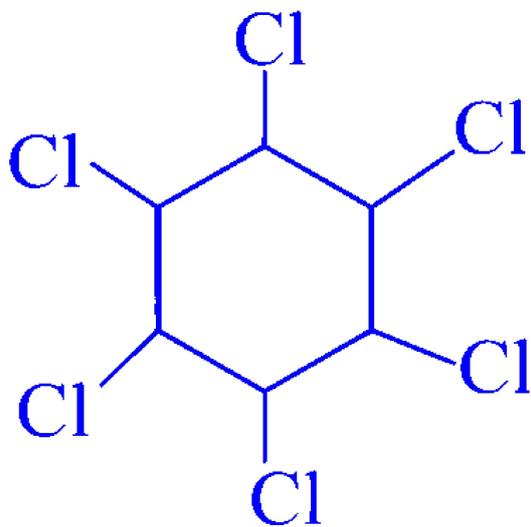
B.



C.



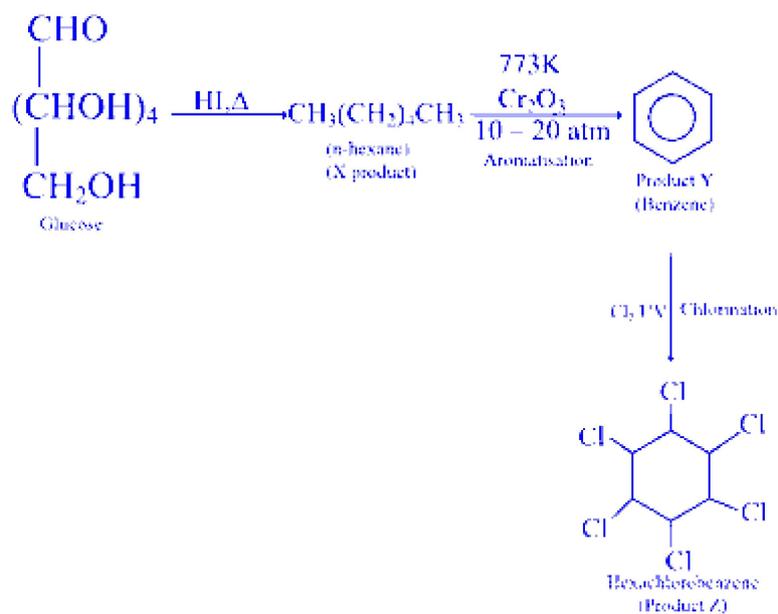
D.



Answer: D

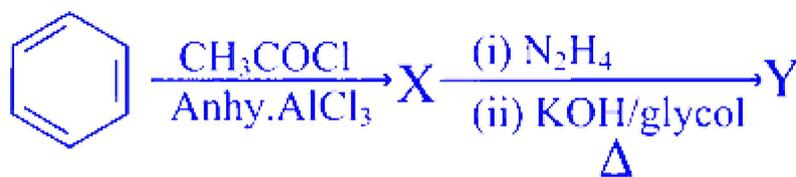
Solution:

The complete reaction is as follows,



Question 5

In the given reaction sequence, conversion of X to Y is an example of



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Options:

A.

Clemmensen reduction

B.

Stephen reduction

C.

Wolf - Kishner reduction

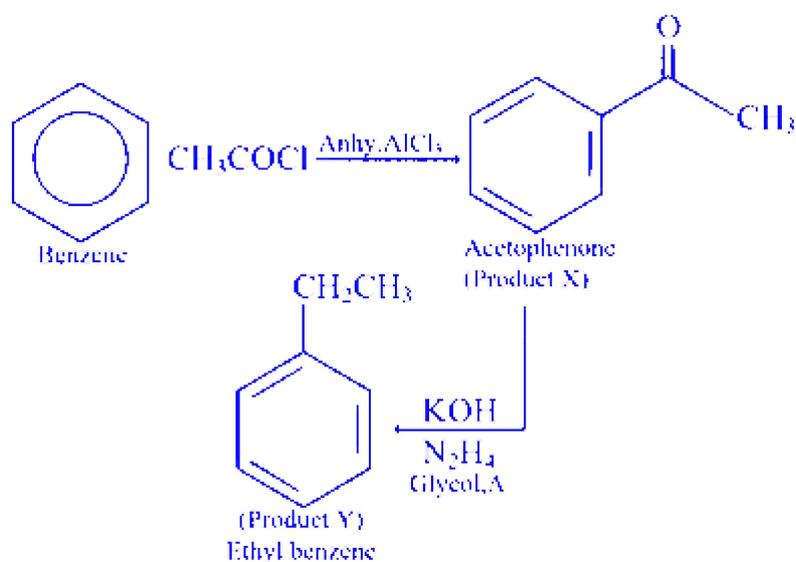
D.

Rosenmund reduction

Answer: C

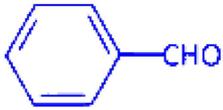
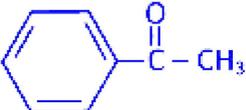
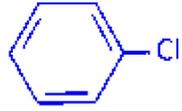
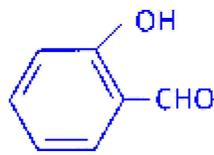
Solution:

The mention reaction is Wolff-Kishner reduction reaction. The complete reaction is,



Question6

Match the following

List-I (Type of Reaction)	List-II (Final Product)
A. Reimer Tiemann reaction	I. 
B. Etard reaction	II. 
C. Sandmeyer reaction	III. 
D. Friedel-crafts reaction	IV. 

The correct answer is

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Options:

A.

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

B.

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

C.

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

D.

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

Answer: C

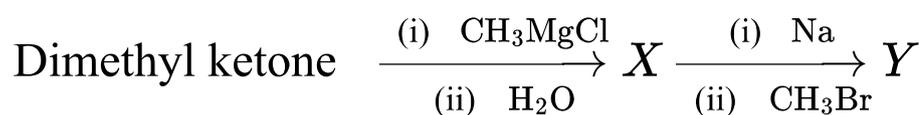


Solution:

The correct match is A-IV, B-I, C-III, D-II

Question 7

Consider the reaction sequence



How many sp^3 carbons are present in Y ?

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Options:

A.

5

B.

4

C.

3

D.

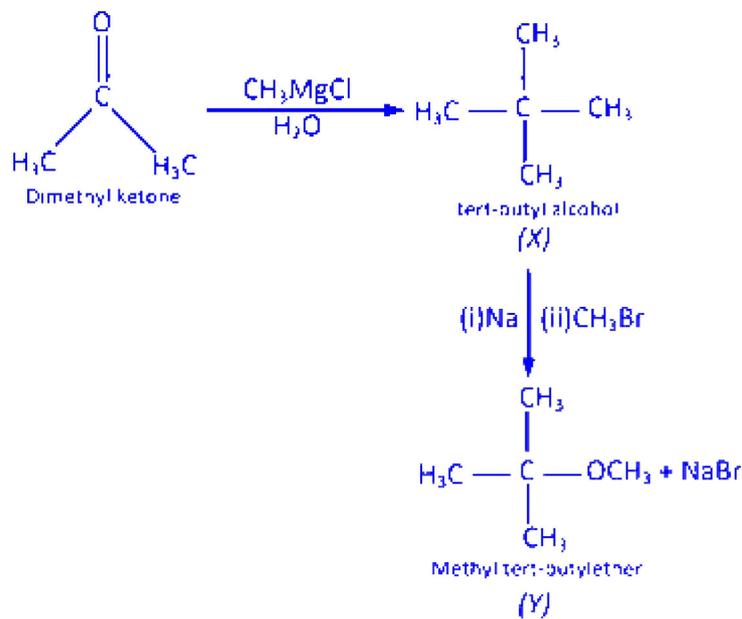
6

Answer: A

Solution:

The complete reaction sequence is as follow





So, the number of sp^3 hybridised carbon in product Y is 5.

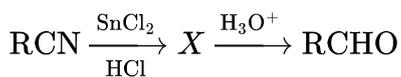
Question 8

Which of the following represents Etard reaction?

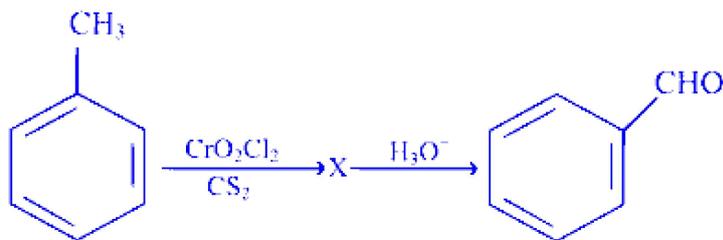
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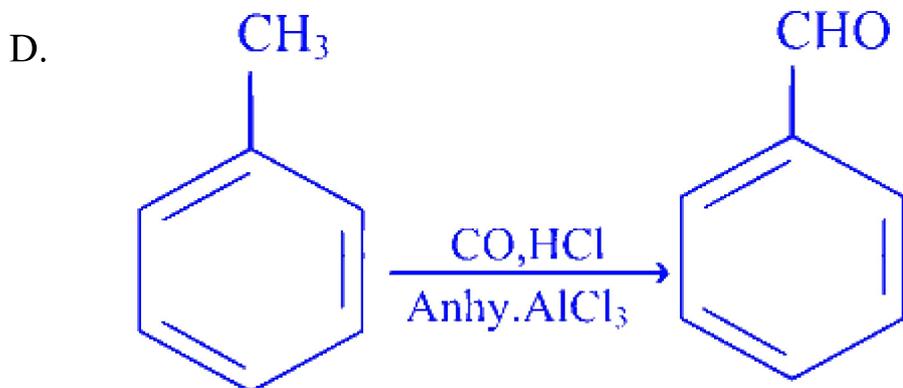
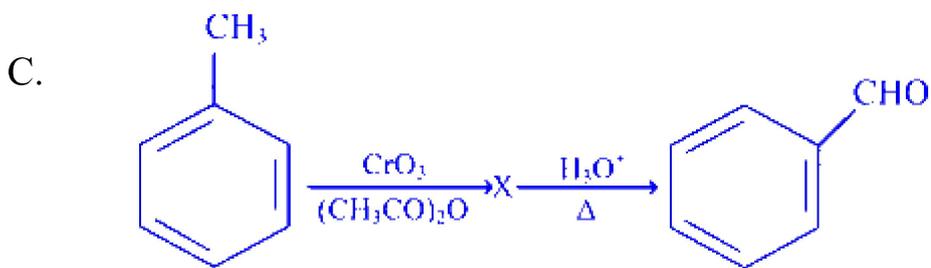
Options:

A.



B.

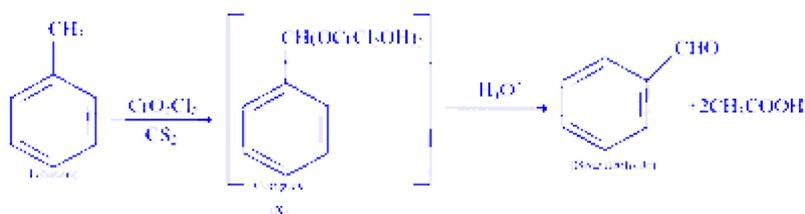




Answer: B

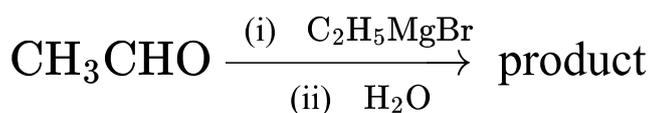
Solution:

Etard Reaction : is a method to oxidise toluene into benzaldehyde



Question9

The correct statement about the product of the following reaction is



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Options:

A.

It undergoes dehydration with 20% H_3PO_4 at 358 K

B.

It gives ketone on oxidation with CrO_3

C.

It does not give positive iodoform test

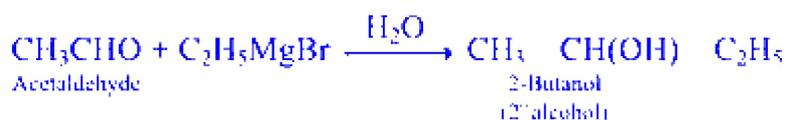
D.

It is a vinylic alcohol

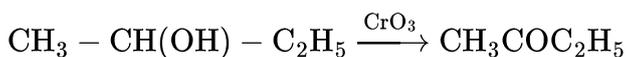
Answer: B

Solution:

Complete reaction is as follows,



When 2° alcohol is oxidised with CrO_3 , Ketone is obtained



Question 10

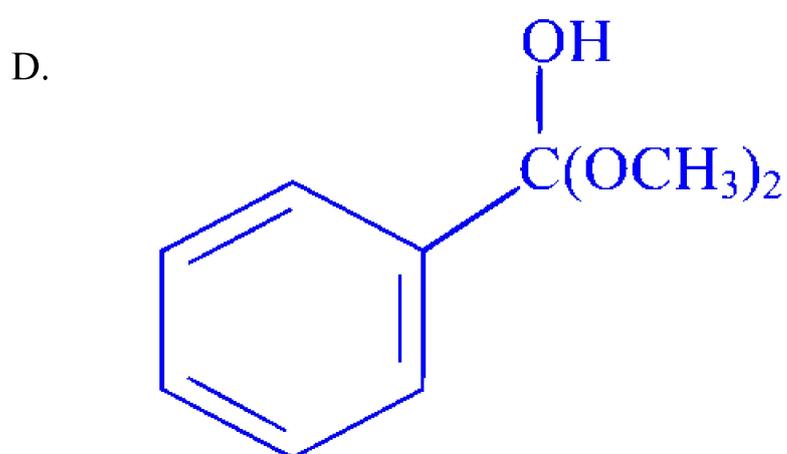
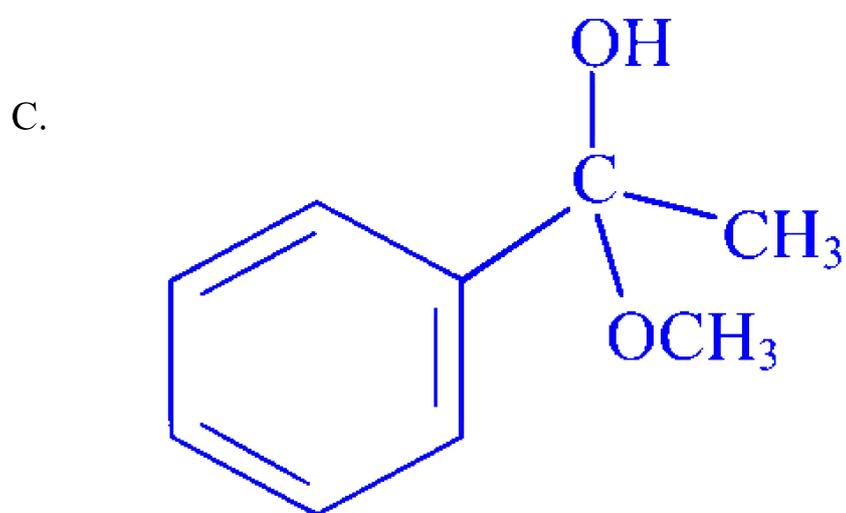
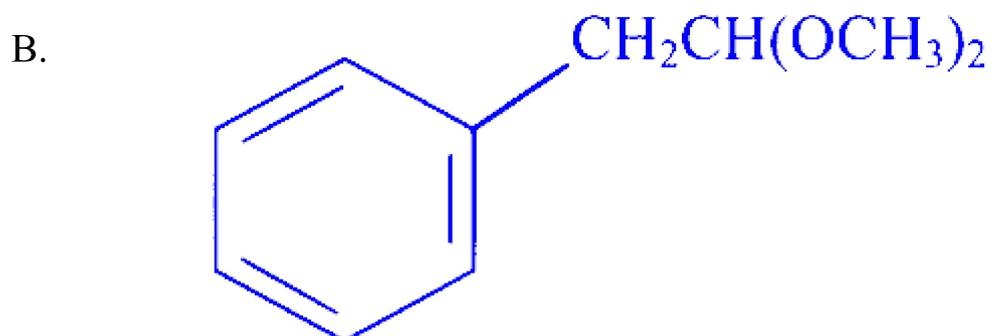
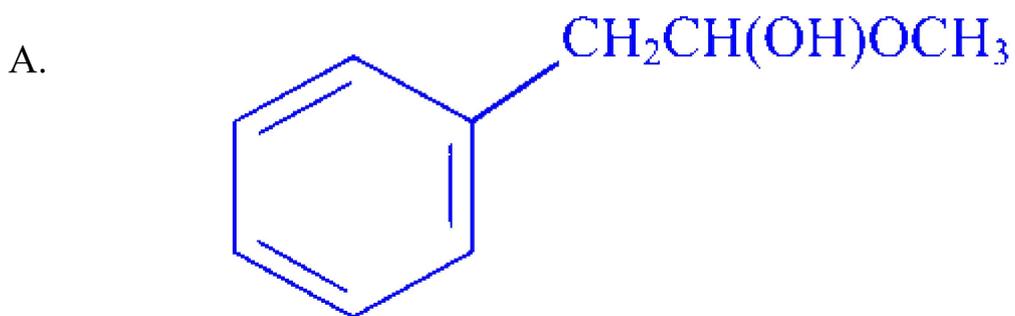
A carbonyl compound X ($\text{C}_8\text{H}_8\text{O}$) gives yellow precipitate with NaOI .

Hemiacetal of X with methanol/dry HCl is

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Options:



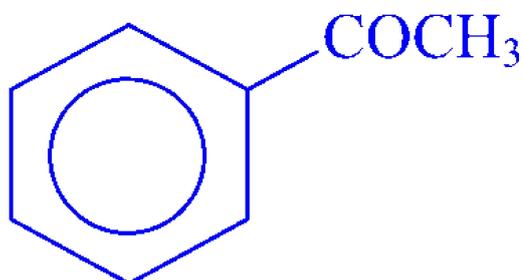


Answer: C

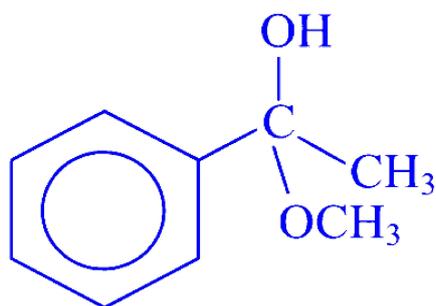
Solution:

The carbonyl compound (X) (C_8H_8O) giving yellow ppt. with NaOI indicates the presence of a methyl ketone. Also, since X is a carbonyl compound not an alcohol thus X must be a methyl ketone.

Now, the above two conditions specifies that X is acetophenone.

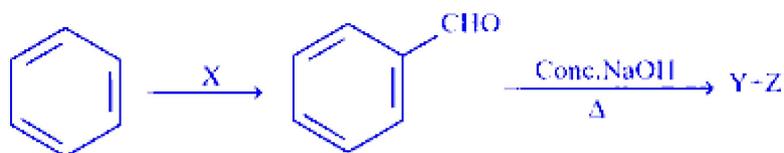


Thus, hemiacetal of X with methanol/dry HCl is



Question11

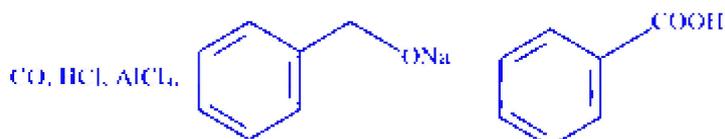
What are X , Y , Z in the following reaction sequence respectively?



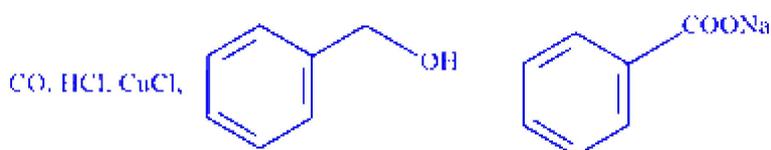
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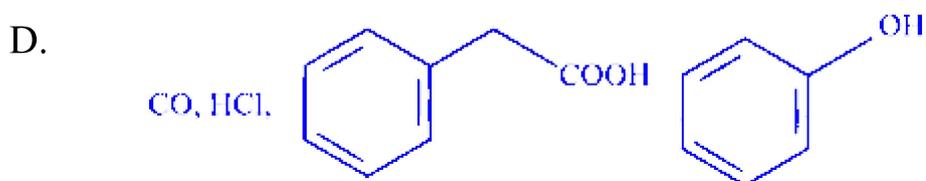
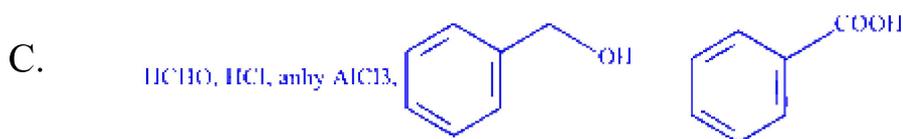
Options:

A.



B.

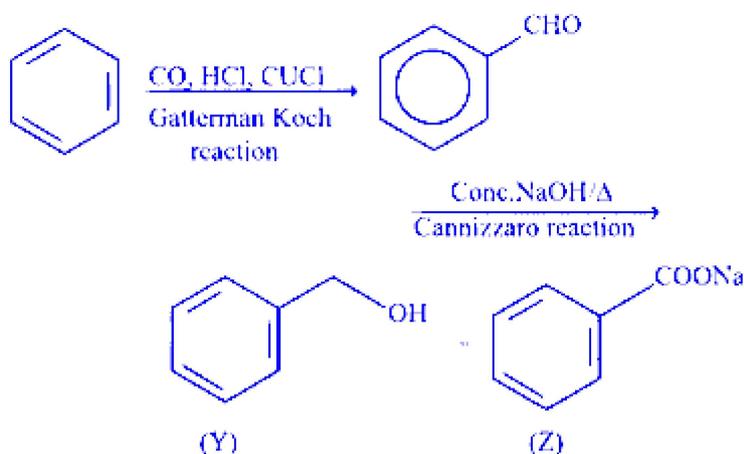




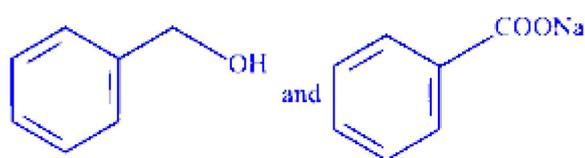
Answer: B

Solution:

The complete reaction sequence is as follows,



Thus X, Y and Z in the given reaction are (CO, HCl, CuCl).



Question12

A Grignard reagent (X) on reaction with carbonyl compound (Y) followed by hydrolysis gave Z . Z reacts with conc. HCl at room temperature, X and Y respectively are

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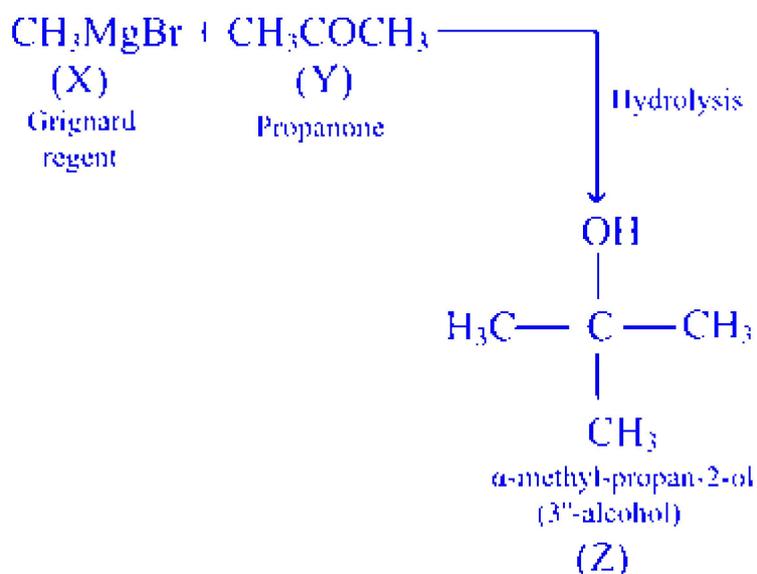


Options:

- A. CH_3MgBr , $\text{CH}_3\text{CH}_2\text{CHO}$
- B. CH_3MgBr , CH_3COCH_3
- C. $\text{CH}_3\text{CH}_2\text{CH}_2\text{MgBr}$, HCHO
- D. $\text{CH}_3\text{CH}_2\text{MgBr}$, CH_3CHO

Answer: B

Solution:

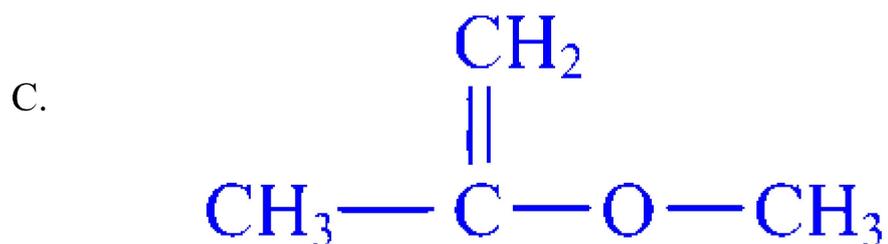


Question13

An organic compound (X) has an empirical formula $\text{C}_4\text{H}_8\text{O}$. This gives a pale yellow precipitate with iodine in NaOH solution. What is X ?

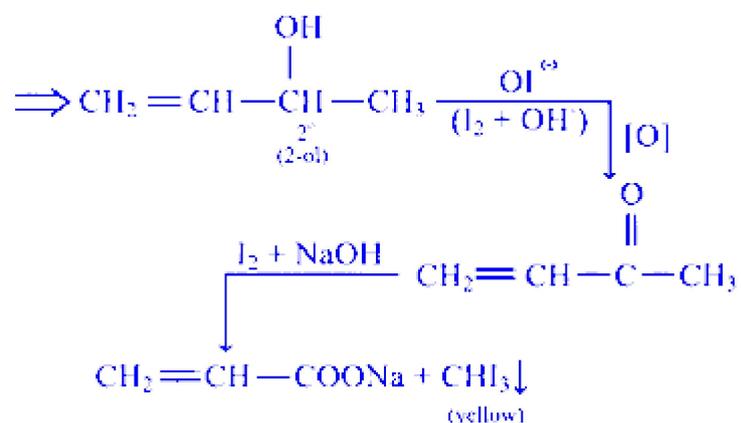
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Options:



Answer: B

Solution:



Question14

Which of the following sets of reagents convert toluene to benzaldehyde?

- A. $\text{Cl}_2 \mid h\nu; \text{H}_2\text{O}, \Delta$
- B. $\text{KMnO}_4 \mid \text{OH}^-; \text{H}^+$
- C. $\text{Cl}_2 \mid \text{Fe}; \text{H}_2\text{O}$
- D. $\text{CrO}_2\text{Cl}_2 \mid \text{CS}_2; \text{H}_3\text{O}^+$

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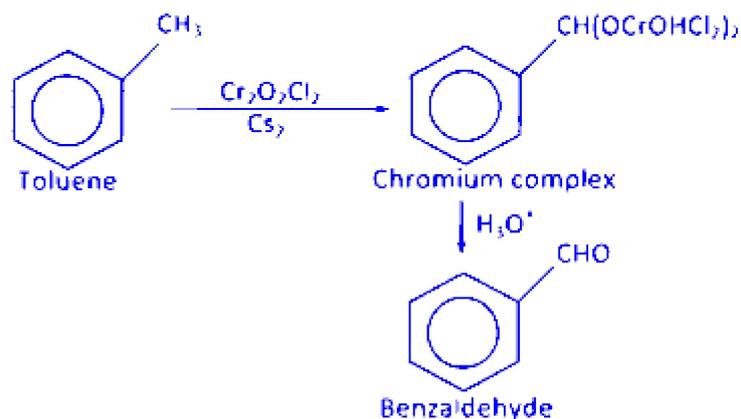
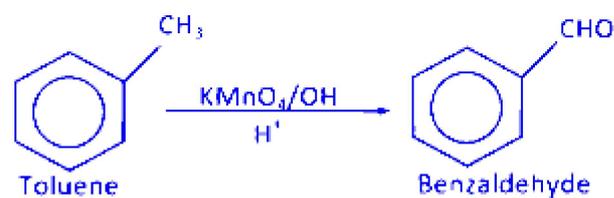
Options:

- A. B, C, D
- B. A, C
- C. A, D
- D. B, D

Answer: D

Solution:

Among the given options only $\text{KMnO}_4/\text{OH}^-$, H^+ and $\text{CrO}_2\text{Cl}_2/\text{CS}_2$, H_3O^+ can convert toluene into benzaldehyde.



Question 15

Match the following reagents with the products obtained when they reacted with a ketone.

List I		List II	
A.	$\text{C}_6\text{H}_5\text{NHNH}_2$	i.	Schiff base
B.	NH_2OH	ii.	Hydrazone
C.	$\text{C}_6\text{H}_5\text{NH}_2$	iii.	Oxime
		iv.	Phenyl hydrazone

Correct answer is

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Options:

A. A-IV, B-III, C-I

B. A-IV, B-II, C-I

C. A-II, B-III, C-IV

D. A-II, B-IV, C-III

Answer: A

Solution:

Let's analyze the reactions step by step:

For reagent A, $C_6H_5NHNH_2$ (phenylhydrazine):

When a ketone reacts with phenylhydrazine, it forms a phenyl hydrazone.

From List II, "Phenyl hydrazone" is option iv.

For reagent B, NH_2OH (hydroxylamine):

Reaction with a ketone gives an oxime.

From List II, "Oxime" is option iii.

For reagent C, $C_6H_5NH_2$ (aniline):

When a ketone reacts with a primary amine like aniline, a Schiff base (imine) is formed.

From List II, "Schiff base" is option i.

Thus, the correct matching is:

A → iv (Phenyl hydrazone)

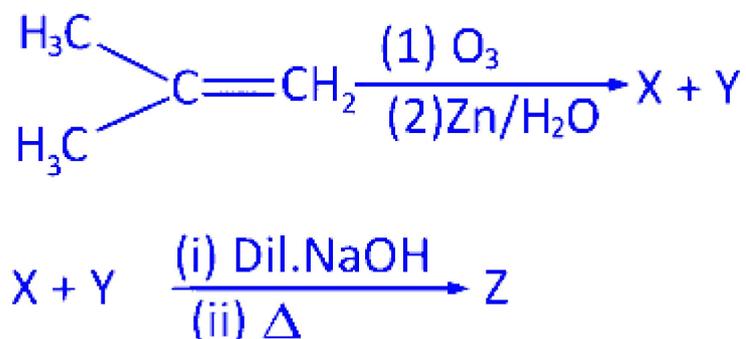
B → iii (Oxime)

C → i (Schiff base)

So, the correct answer is: Option A, A-IV, B-III, C-I.

Question 16

Consider the reactions,



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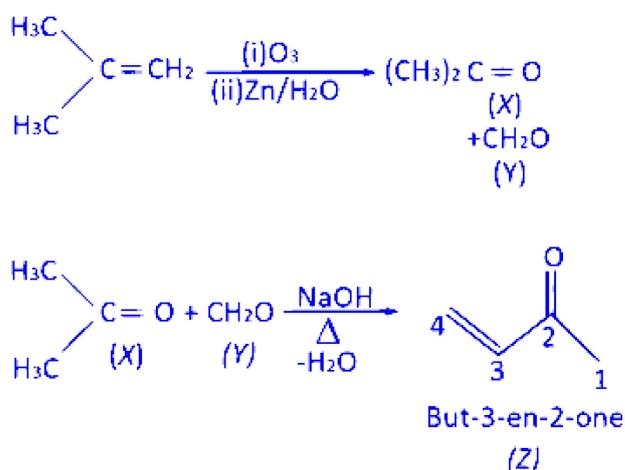
Options:

- A. But-1-en-3-one
- B. 4-hydroxybutan-2-one
- C. But-3-en-2-one
- D. 1-hydroxybutan-3-one

Answer: C

Solution:

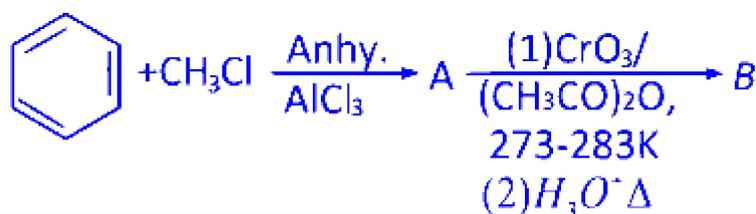
The reactions involved are as follows



Thus, the IUPAC name of the compound is but-3-en-2-one.

Question 17

The incorrect statement about ' B ' is



The incorrect statement about *B* is

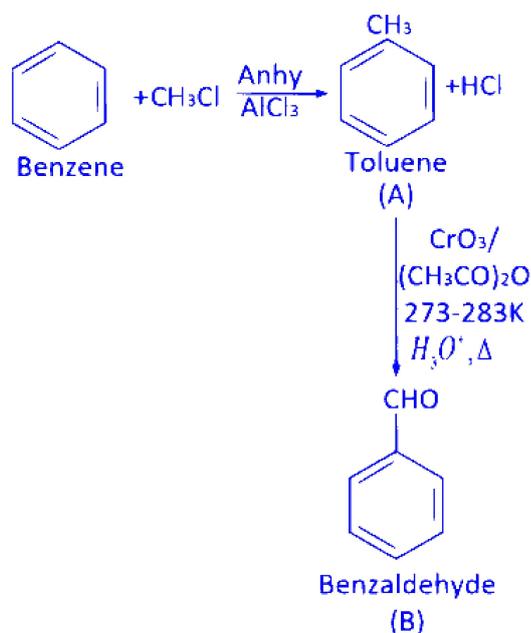
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Options:

- A. It gives test with Tollen's reagent
- B. It gives test with Fehling's solution
- C. It does not give test with NaOH + I₂ solution
- D. It forms acid and alcohol with concentrated NaOH, following by acidification

Answer: B

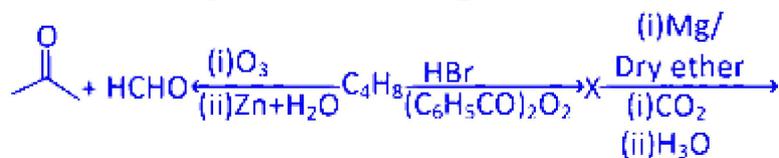
Solution:



The incorrect statement about *B* i.e. benzaldehyde is given in option (b) as it (an aromatic aldehyde) does not give test with Fehling's solution.

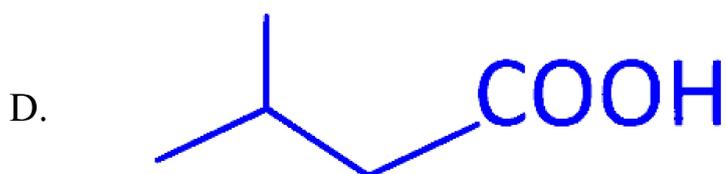
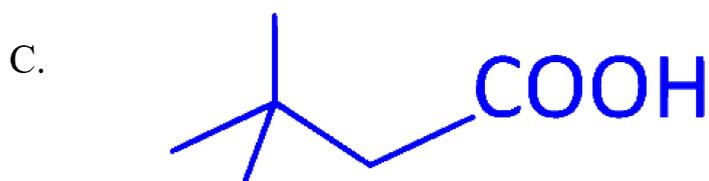
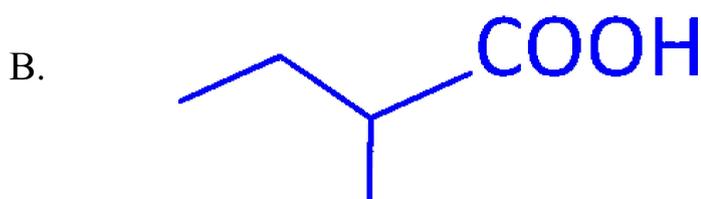
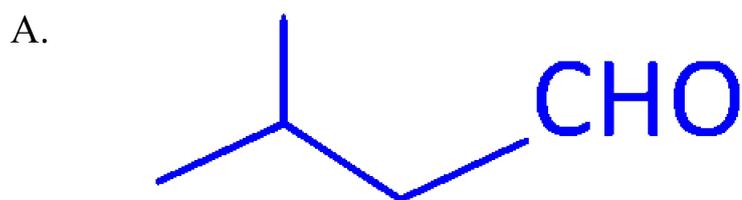
Question18

What is Y in the following reaction sequence?



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Options:

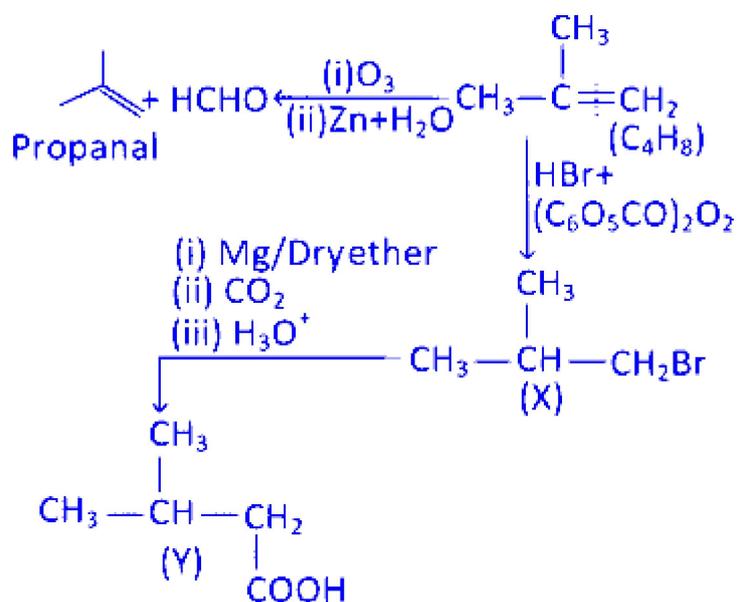


Answer: D

Solution:

The complete reaction sequence is as follows





Thus, the compound Y is



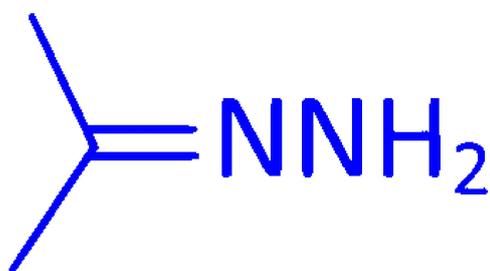
Question19

A carbonyl compound X ($\text{C}_3\text{H}_6\text{O}$) on oxidation gave a carboxylic acid Y ($\text{C}_3\text{H}_6\text{O}_2$). Oxime of X is

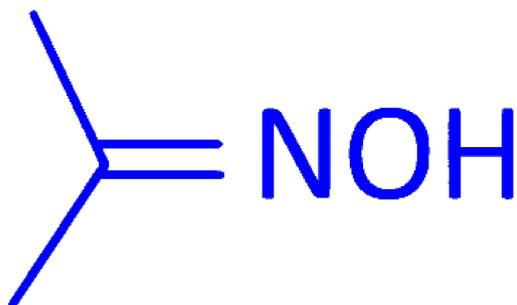
AP EAPCET 2024 - 19th May Evening Shift

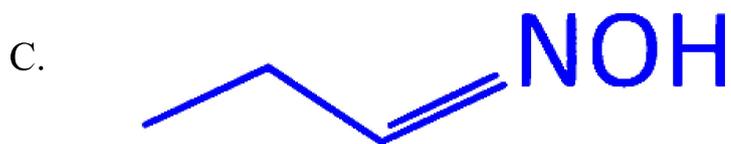
Options:

A.



B.

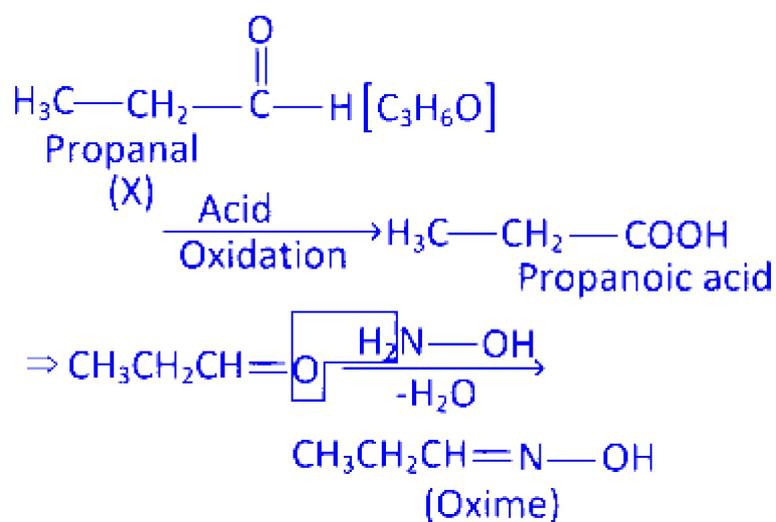




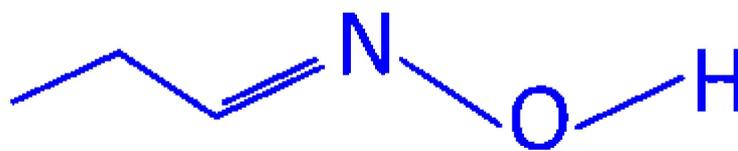
Answer: C

Solution:

The reaction sequence according to question is,

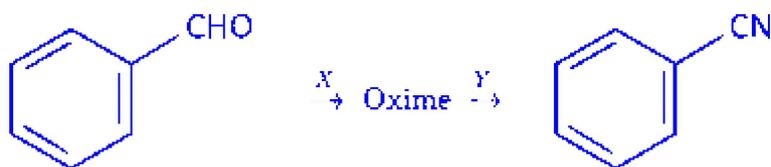


So, the oxime of compound X i.e. propanol is



Question20

What are X and Y respectively in the following reaction sequence?



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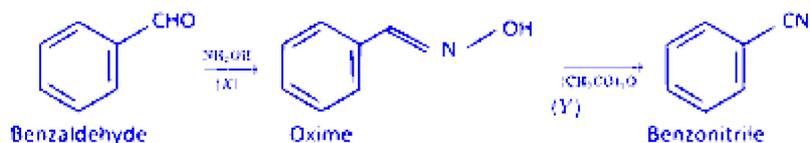
Options:

- A. NH_2NH_2 , $\text{C}_2\text{H}_4\text{SO}_2$ CV Pyridine
- B. NH_2NH_2 , $(\text{CH}_3\text{CO}_2)_2\text{O}$
- C. $\text{NH}_2\text{OHC}_4\text{H}_5\text{SO}_3\text{OY}$ Pynidine
- D. NH_2OH , $(\text{CH}_3\text{CO}_2)_2\text{O}$

Answer: D

Solution:

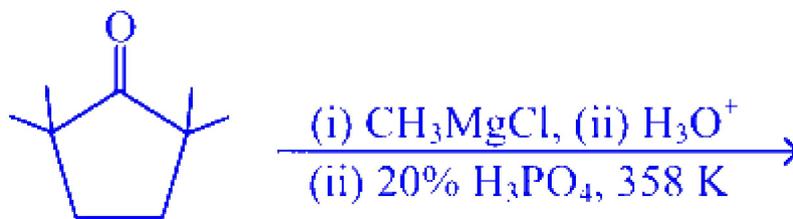
The complete reaction is as follows.



$X = \text{NH}_2\text{OH}$ and $Y = (\text{CH}_3\text{CO})_2\text{O}$

Question21

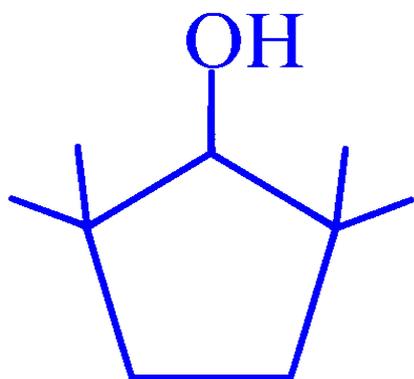
Identify the major product from the following reaction sequence.



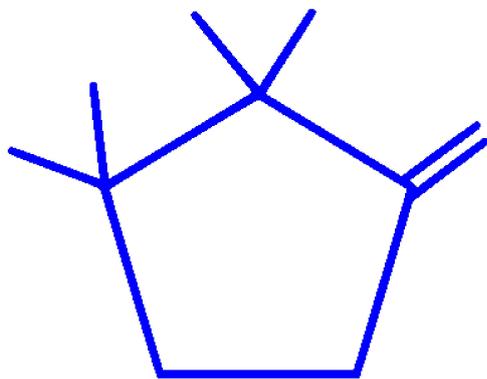
AP EAPCET 2022 - 5th July Morning Shift

Options:

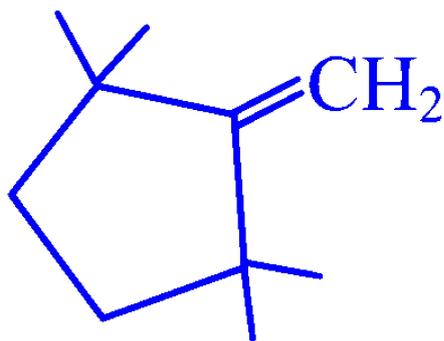
A.

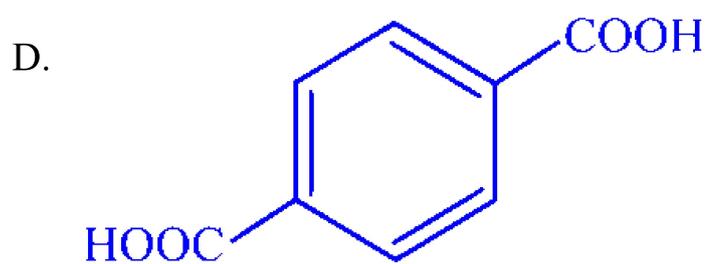
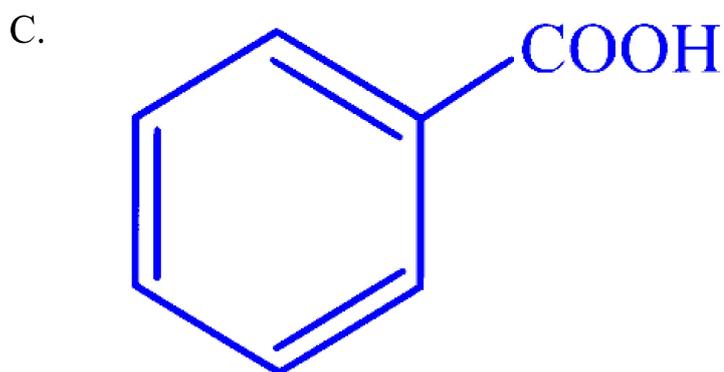
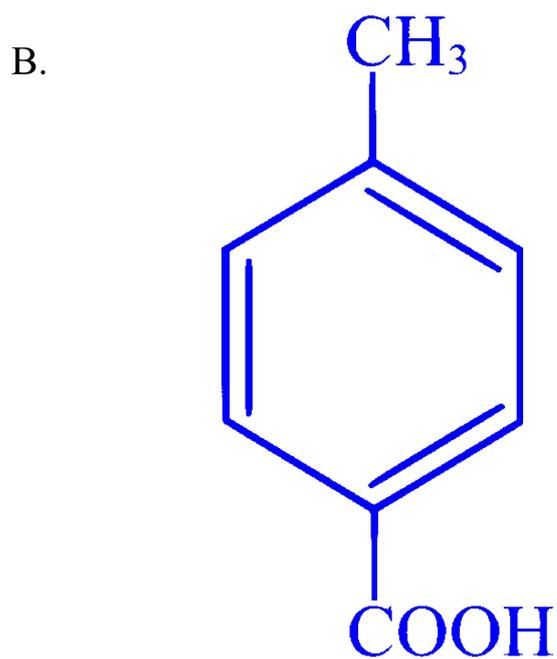
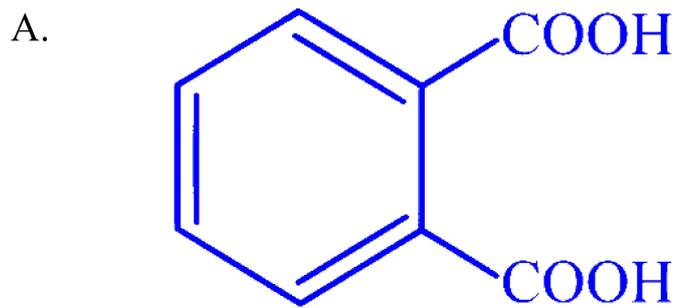


B.



C.

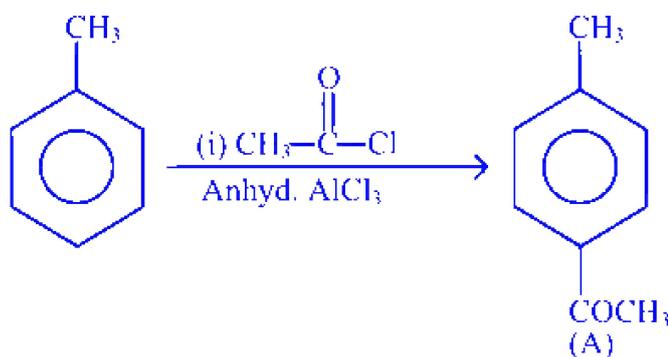




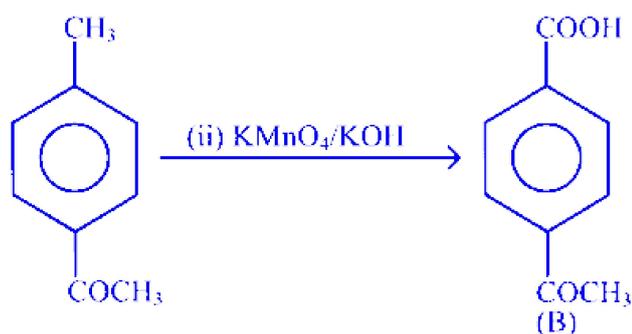
Answer: D

Solution:

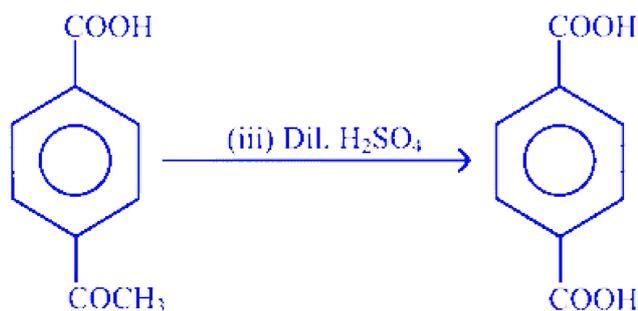
Friedel-Crafts acylation of toluene gives p-acylated product.



Product A in presence of KMnO₄/KOH gives benzoic acid derivative. Here, methyl group is oxidised to –COOH group.

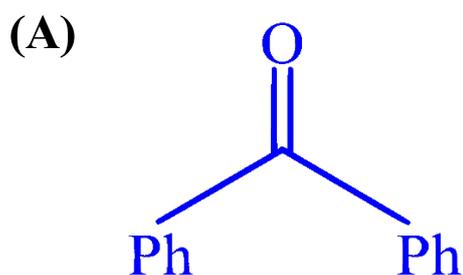


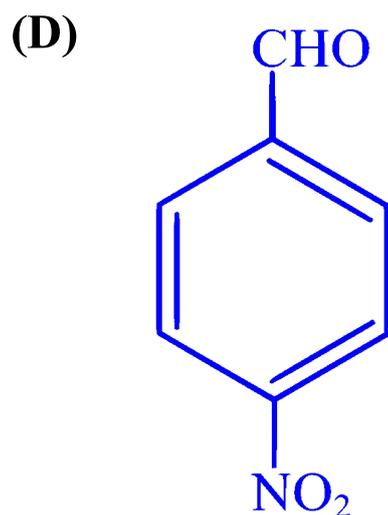
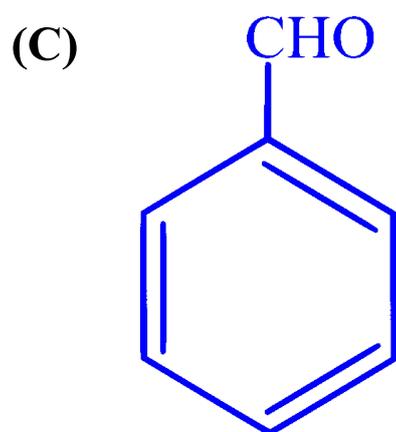
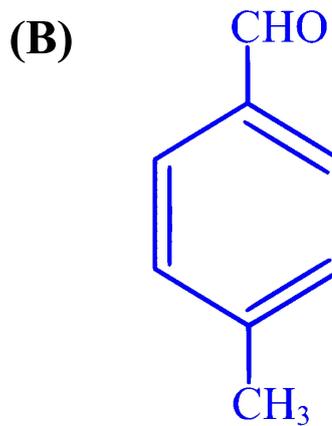
Product B in presence of H₂SO₄ get hydrolysed to form –COOH group at para-position as well.



Question23

Arrange the following in increasing order of their reactivity for nucleophilic addition reaction.





AP EAPCET 2022 - 4th July Morning Shift

Options:

A. $A < B < C < D$

B. $A < D < C < B$

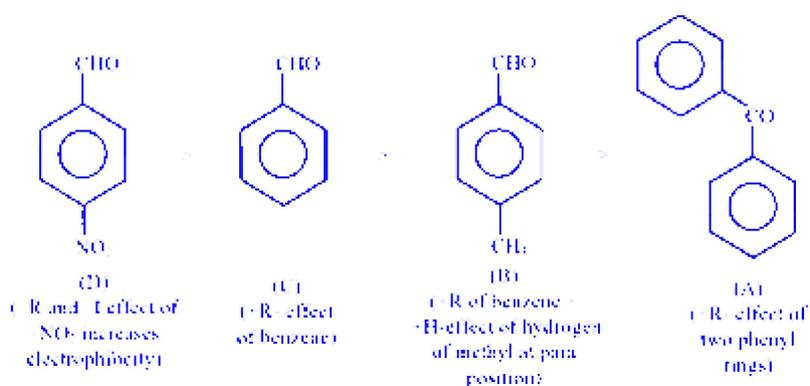
C. $C < B < A < D$

D. $C < A < B < D$

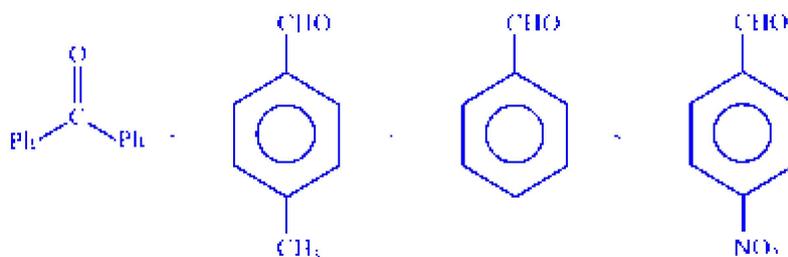
Answer: A

Solution:

In nucleophilic addition reaction, nucleophile attacks at the electrophilic carbonyl centre. The order of electrophilicity is



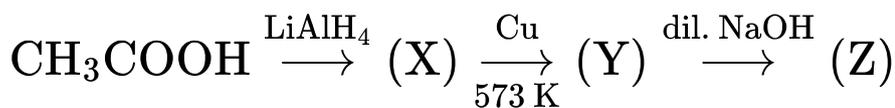
So, the increasing order of their reactivity for nucleophilic addition reaction is



i.e. $A < B < C < D$

Question 24

Identify (Z) in the following reaction.



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Options:

B. 4

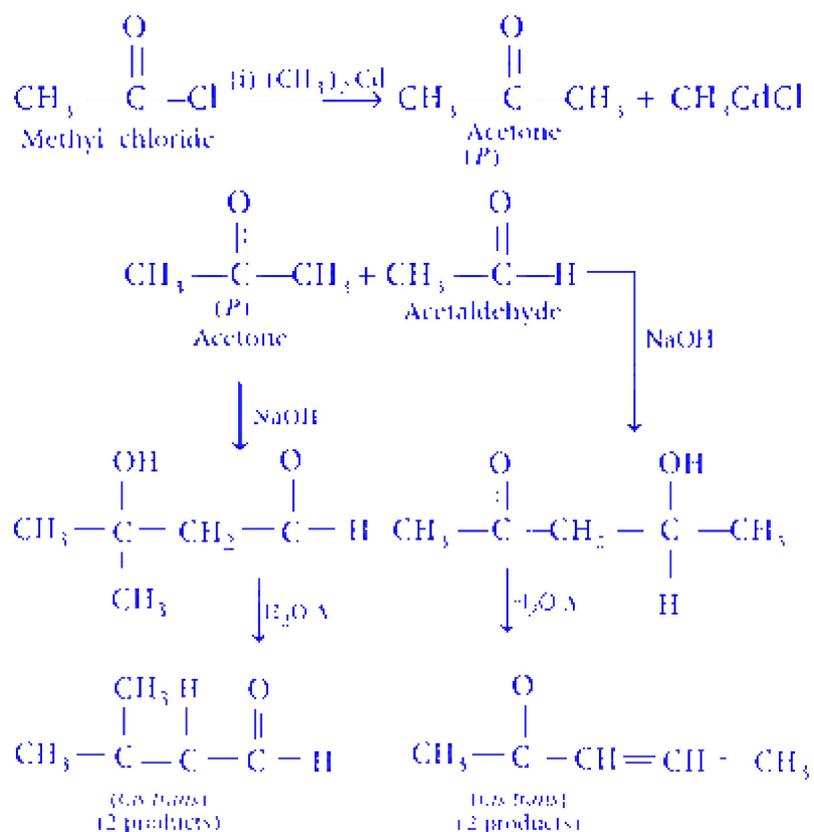
C. 1

D. 3

Answer: B

Solution:

When CH_3COCl react with $(\text{CH}_3)_2\text{Cd}$, it will form acetone as a product (P). On further step, acetone (P) react with acetaldehyde to give aldol condensation reaction and formed α, β -unsaturated alkene product.



Hence, total products in final step are 4.

