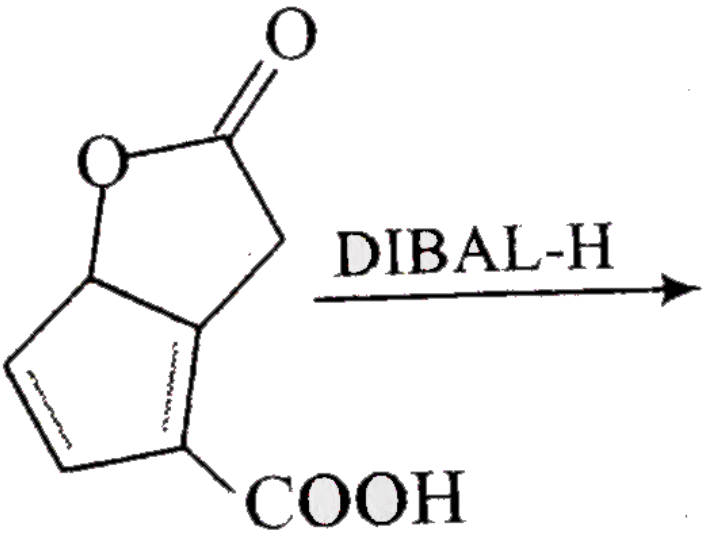
CHEMISTRY

BOOKS - IIT-JEE PREVIOUS YEAR (CHEMISTRY)

AROMATIC ALDEHYDES, KETONES AND ACID

Jee Main And Advanced

1. The major product obtained in the following



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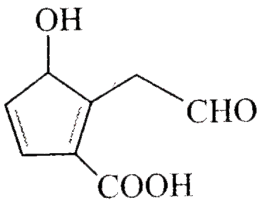

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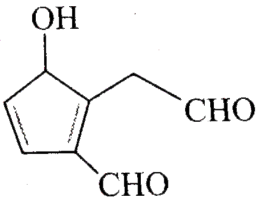
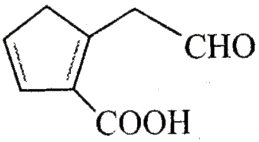
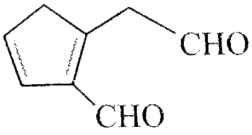


C. 

D. 

Answer: A

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2. In the following squence of reactions

$$\text{Toluene} \xrightarrow{KMnO_4} A \xrightarrow{SoCl_2} B \xrightarrow[BaSo_4]{H_2/Pd}, \text{C} \quad \text{the product C is}$$

A. C_6H_5COOH

B. $C_6H_5CH_3$

C. $C_6H_5CH_2OH$

D. C_6H_5CHO

Answer: D

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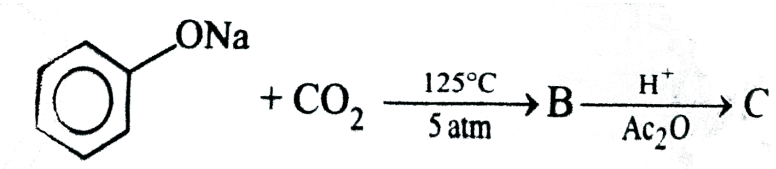
3. Sodium phenoxide when heated with CO_2 under pressure at $125^\circ C$ yield a product which on acetylation gives product C



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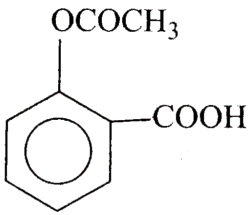

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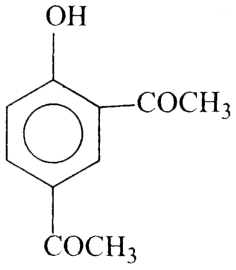

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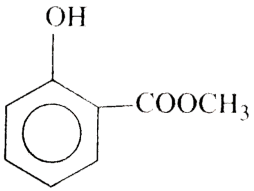

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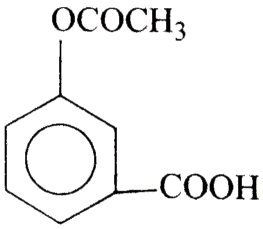

Answer: A

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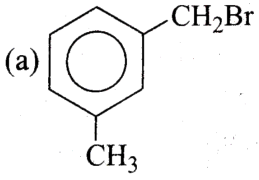
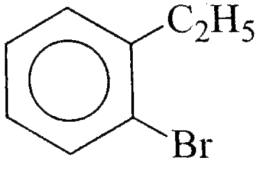
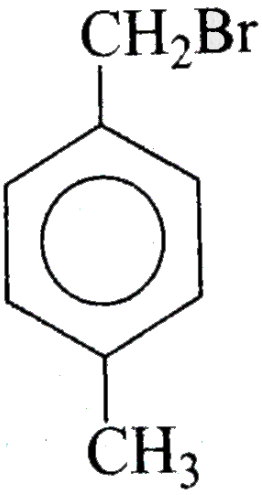
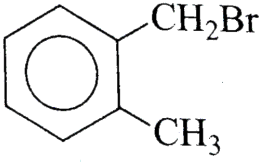
4. Compund $(A)C_8H_9$ Br gives a white precipitate when warmed with alcoholic $AgNO_3$ Oxidation of (A) gives an acid (B) $C_8H_6O_4$ (B) easily anhydride on heating Identify the compound (A) .

A. 

B. 

C. 

D. 

Answer: D

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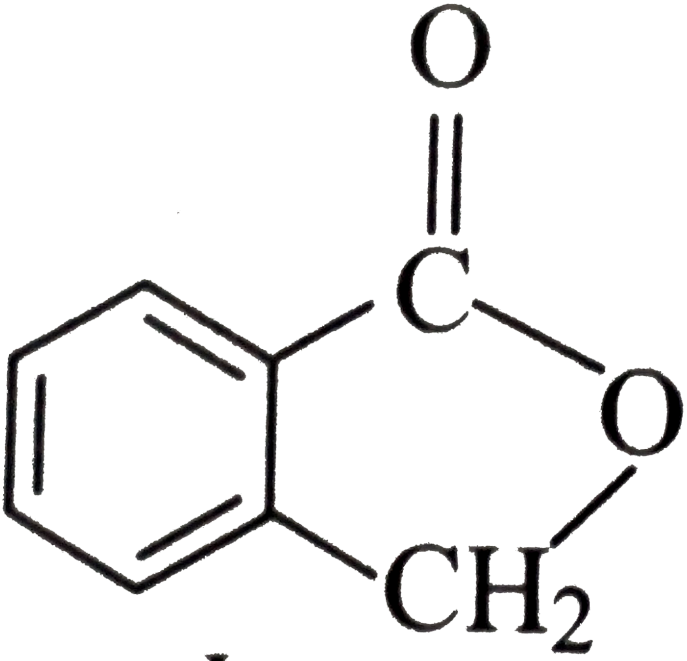
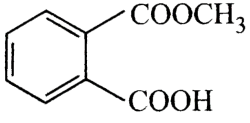
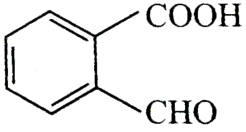
5. Which of the following reactants on reaction with conc. NaOH followed by acidification gives following

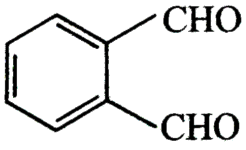
lactone as the main product ?

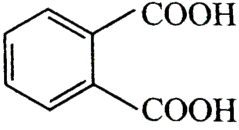


Lactone

A. 

B. 

C. 

D. 

Answer: C

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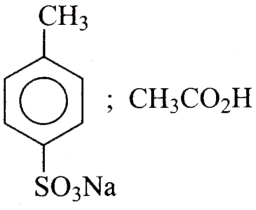
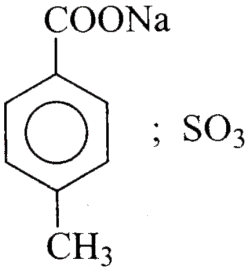
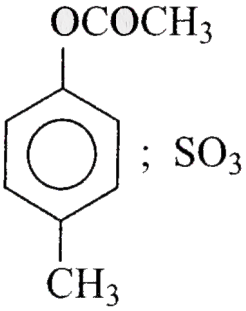
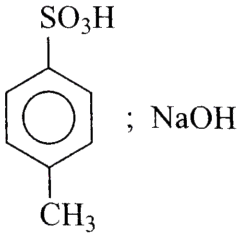
6. 4-Methyl benzene sulphoic acid reacts with sodium acetate to give :

A. 

B. 

C. 

D. 

Answer: A

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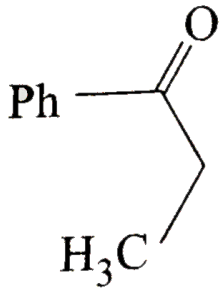
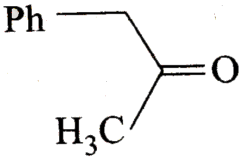
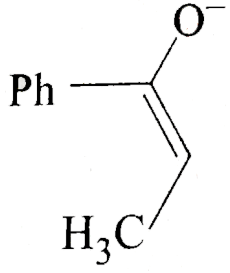
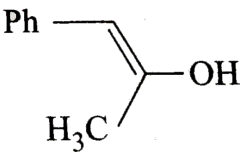
7. $Ph - C \equiv C - CH_3 \xrightarrow{Hg^{2+} / H^+} A$, A is

A. 

B. 

C. 

D. 

Answer: A

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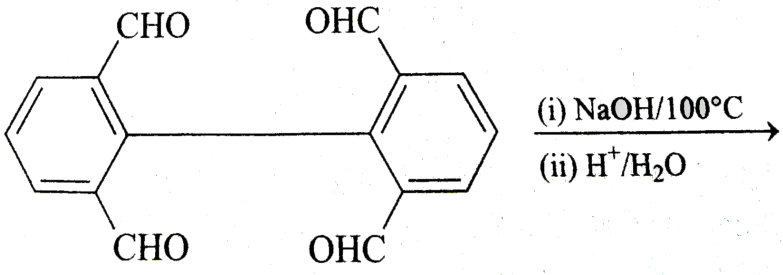
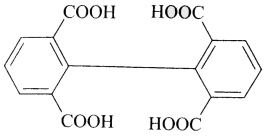
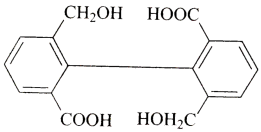
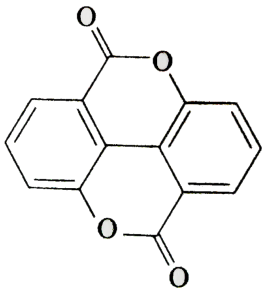
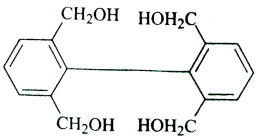
8. 

Major product

A. 

B. 

C. 

D. 

Answer: B

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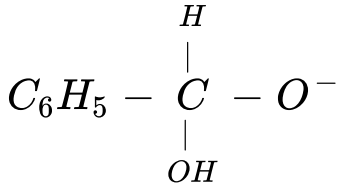
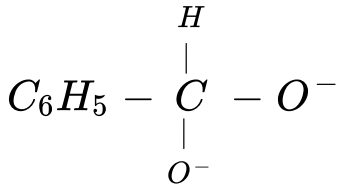
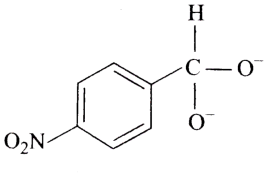
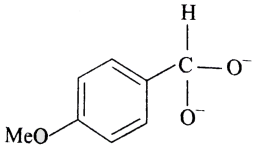
9. In a Cannizaro reaction the intermediate that will be the best hydride donor is

A. 

B. 

C. 

D. 

Answer: D

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10. In the Cannizzaro reaction given below:

$2Ph - CHO \xrightarrow{\overset{\Theta}{OH}} Ph - CH_2OH + PhCO_2^-$ the slowest step is:

A. the attack of _OH at the carbony1 group

B. the transfer of hydride to the cardony1 group

C. the abstraction of proton from the carboxy,ic acid

D. the deprotonation of $PH - CH_2OH$

Answer: B

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11. m-Chlorobenzaldehyde on reaction with conc. KOH at room temperature gives:

A. potassium m-chlorobenzoate and m-choorobenzy1 alcohol

B. m-hydroxy benzaldeehyde ans m-choorobenzy1 alcohol

C. m-chlorobenzy1 alcohol and m-hydroxy benzy1 alcohol

D. potassium m-chlorobenzoate and m-hydroxy benzaldeehyde

Answer: A

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12. Compound p and R upon ozonolysis produce Q and S,

respectively . The molecular fromular of Q and S id C_8H_8O. Q

undergoes Cannizzaro reaction but not halofrom

reaction ,

whereas S undergoes halofrom reaction but not Cannizzaro

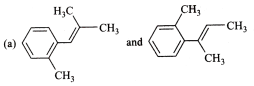
reaction .

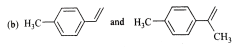
$$(i)P \xrightarrow[(ii)\,Zn/H_2O]{(i)\,O_3/CH_2Cl_2} Q_{(C_8H_8O)}$$

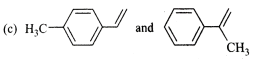
(ii) $$R \xrightarrow[(ii)\,Zn/H_2O]{(i)\,O_3/CH_2Cl_2} S_{(C_8H_8O)}$$

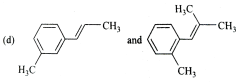
The option (s) with suitable combination of P and R,

respectively , is(are)

A. 

B. 

C. 

D. 

Answer: A::B::C

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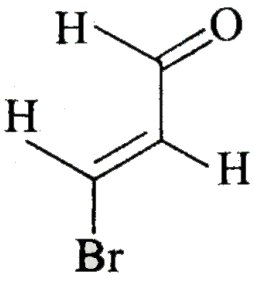
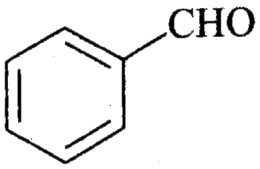
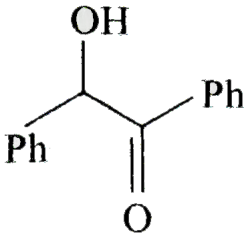
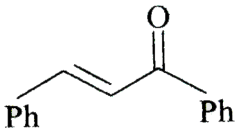
13. Positive Tollen 's test is oberveved for

A. 

B. 

C. 

D. 

Answer: A::B::C

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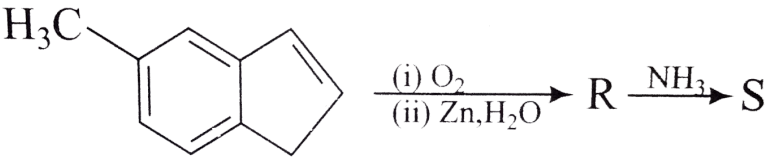
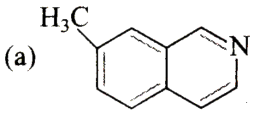
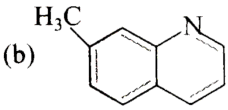
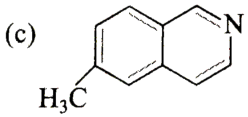
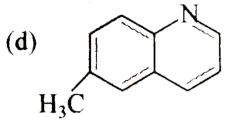
14. In the following reactions the product S is



A. 

B. 

C. 

D. 

Answer: A

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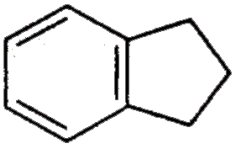
15. In the following reaction sequence, the compound J is an interemediate

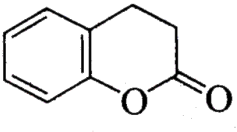
$$I \xrightarrow[CH_3COONa]{(CH_3CO)_2O} J \xrightarrow[\substack{(ii)\,SOCl_2\\(iii)\,\text{anhyd.}\,AlCl_3}]{(i)\,H_2,Pd/C} K$$

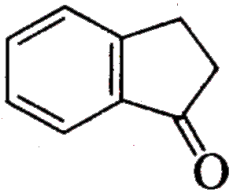
$J(C_9H_8O_2)$ gives effervsecence on the treament with $NaHCHO_3$

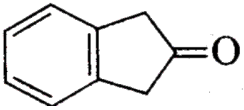
and positive Baeyr's test.

The compound K, is

A. 

B. 

C. 

D. 

Answer: C

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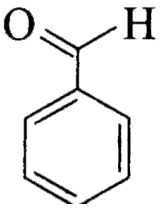
16. In the following reaction sequence, the compound J is an interemediate

$$I \xrightarrow[CH_3COONa]{(CH_3CO)_2O} J \xrightarrow[\substack{(ii)\,SOCl_2 \\ (iii)\,\text{anhyd.}\,AlCl_3}]{(i)\,H_2, Pd/C} K$$

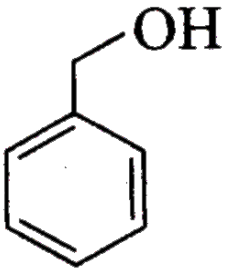
$J(C_9H_8O_2)$ gives effervsecence on the treament with $NaHCHO_3$ and positive Baeyr's test.

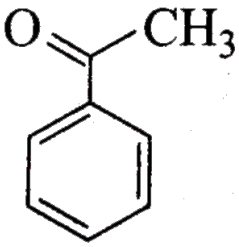
The compound I , is

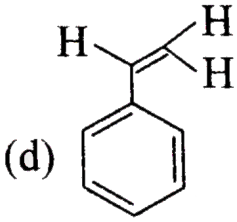
A. (a)



B.



C. 

D. 

Answer: A

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17. The structure of the intermedite prouduct formaed by the

oxidation toluene with CrO_3 and acetic anhydride

,whodse

hydrolysis gives benzaldehyde is.....

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18. Benzaldehyde undergoies aldol condensation in an alkaline

medium.

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19. Five isomeric para-disubsituted atomatic compounds (A) to (E) with molecular formula $C_8H_8O_2$ were given for identification. Based on the

following observations give structures of the compounds.

(i) Both (A) and (B) form silver mirror with Tollens reagent. Further, (B) gives a positive test with $FeCl_3$ solution.

(ii) (C) gives positive iodoform test.

(iii) (D) is readily extracted in aqueous $NaHCO_3$ solution.

(iv) (E) on acid hydrolysis gives $1,4-$ dihydroxy benzene.

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20. An organic compound (A) $C_8H_4O_3$, in dry bebzene in the presence of anhydrous $AlCl_3$ gives compound (B). The compound (B) on treatment with PCl_5 followed by reaction with $H_2 / Pd(BaSo_4)$ gives compound (C) which on reaction with hydrazine gives a cyclide compound (D) $(C_{14}H_{10}N_2)$. Identify (A), (B) (C), and (D) Explain the formation of (D) from (C).

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21. Explain ,Who o-hydroxy bezaldehyde is a high melting

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22.

Column 1		Column 2		Column 3	
(I)	Toluene	(i)	$NaOH/Br_2$	(P)	Condensation
(II)	Acetophenone	(ii)	$Br_2/h\nu$	(Q)	Carboxylation
(III)	Benzaldehyde	(iii)	$(CH_3CO)_2O/CH_3COOK$	(R)	Substitution
(IV)	Phenol	(iv)	$NaOH/CO_2$	(S)	Haloform

The only CORRECT combination in which the reaction proceeds through radical mechanism is

A. $(IV)(i)(Q)$

B. $(III)(ii)(P)$

C. $(II)(iii)(R)$

D. $(I)(ii)(R)$

Answer: D

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23.

Column 1		Column 2		Column 3	
(I)	Toluene	(i)	$NaOH/Br_2$	(P)	Condensation
(II)	Acetophenone	(ii)	$Br_2/h\nu$	(Q)	Carboxylation
(III)	Benzaldehyde	(iii)	$(CH_3CO)_2O/CH_3COOK$	(R)	Substitution
(IV)	Phenol	(iv)	$NaOH/CO_2$	(S)	Haloform

For the sythesis of benzoic acid, the only CORRECT combation is

A. $(II)(i)(S)$

B. $(I)(ii)(Q)$

C. $(IV)(iii)(P)$

D. $(III)(ii)(R)$

Answer: A

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Column 1		Column 2		Column 3	
(I)	Toluene	(i)	$NaOH/Br_2$	(P)	Condensation
(II)	Acetophenone	(ii)	$Br_2/h\nu$	(Q)	Carboxylation
(III)	Benzaldehyde	(iii)	$(CH_3CO)_2O/CH_3COOK$	(R)	Substitution
(IV)	Phenol	(iv)	$NaOH/CO_2$	(S)	Haloform

24. The only CORRECT combination that given two different carboxylic acids is

A. $(IV)(i)(Q)$

B. $(II)(ii)(R)$

C. $(I)(iii)(s)$

D. $(III)(iii)(Q)$

Answer: D

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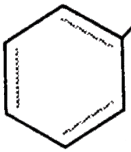
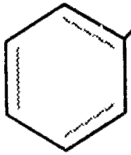
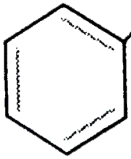
25. Among The following the number of reaction(s) that

prouduce(s) benzadelhyde is

I.  $\xrightarrow[\text{Anhydrous } AlCl_3 / CuCl]{CO, HCl}$

II.  $\xrightarrow[100°C]{H_2O}$

III.  $\xrightarrow[Pd\text{-}BaSO_4]{H_2}$

IV.  $\xrightarrow[\text{Toluene, } -78°C]{\text{DIBAL-H}}$ H_2O

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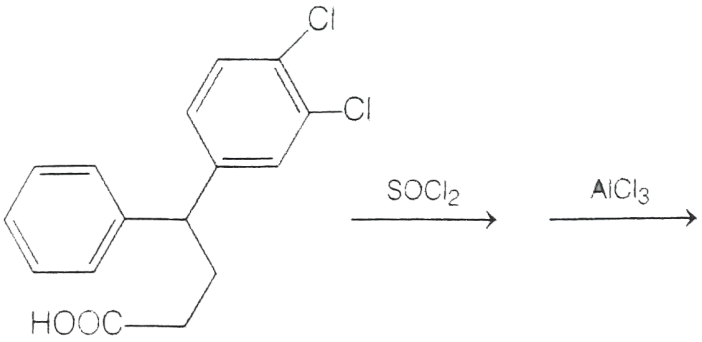
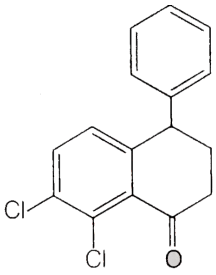
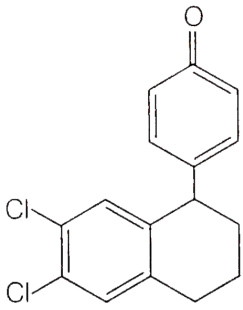
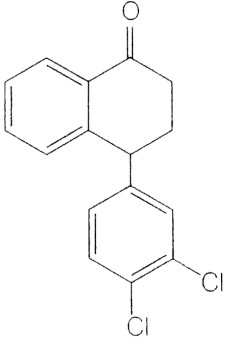
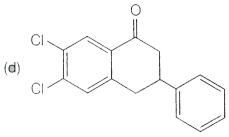
26. In the following sythesis ther major prouduct formed is



A. 

B. 

C. 

D. 

Answer: C

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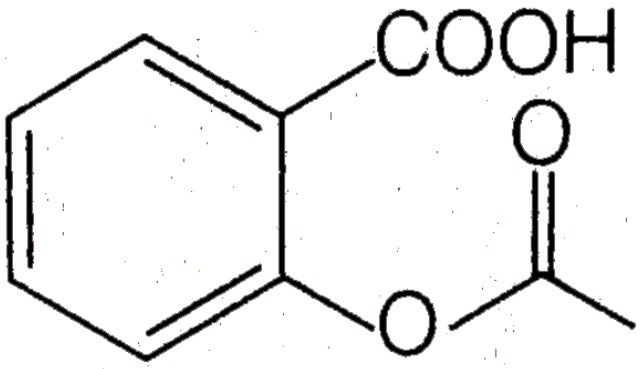
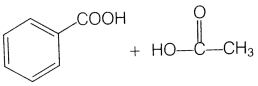
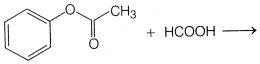
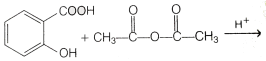
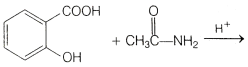
27. Which of the following is the best method for preparing aspirin?



A. 

B. 

C. 

D. 

Answer: c

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28. Which of the following isnot a synthesis of benzophenone ?

$(C_6H_5COC_6H_5)$

A. $C_6H_5 + C_6H_5COCl \xrightarrow{AlCl_3}$

B. $(C_6H_5)_2CHOH \xrightarrow[\text{acetone}]{H_2CrO_4}$

C. $(C_6H_5)_2C = CH_2 \xrightarrow[(ii)\, Zn, HOAc]{(i)\, O_3}$

D. $C_6H_5COOH + 2C_6H_5Li \xrightarrow[(ii)\, H_2O]{(i)\, \text{Ether}}$

Answer: b

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29. Which will not produces benzoic acid ?

A. $C_6H_5CH_2OH + KMnO_4.^- OH / H_2O, \Delta$ then H_3O^+

B. $C_6H_5CH_3 + KMnO_4 /^- OH / H_2O, \Delta$ then H_3O^+

C. $C_6H_6 + CO_2$, high pressure

D. $C_6H_5COCl + .^- OH / H_2O$, then H_3O^+

Answer: c

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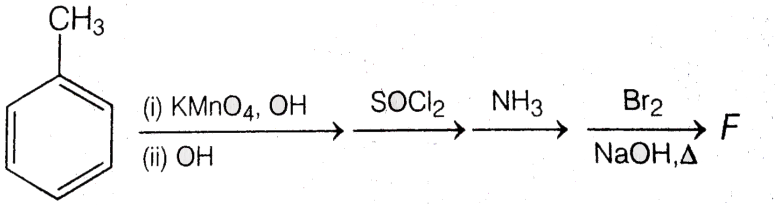
30. Which the a product F, of reaction ?



A. $C_6H_5CONH_2$

B. $C_6H_5CONHBr$

C. $C_6H_5NH_2$

D. $p - CH_3C_6H_4NH_2$

Answer: c

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31. Which of the following are more reactive than unsubtituted benzaldehyde in a Perkin reaction ?

A. p-chloro benzaldehyde

B. p-aminobenzaldehyde

C. p-methoxy benzaldehyde

D. Benzene-1,4-dicarbaldehyde

Answer: (a,d)

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32. Banzaldehyde can be prepared slectively by

A. $\text{Toluene} \xrightarrow[(CH_3CO)_2O]{CrO_3}$

B. $\text{Toluene} \xrightarrow[(CH_3CO)_2O]{CrO_2Cl_2}$

C. $\text{Toluene} \xrightarrow[KOH_{aq.}]{KMnO_4}$

D. $C_6H_5CH_2OH \xrightarrow[\text{Pyridibne}/HCl]{CrO_3}$

Answer: (d,a,b)

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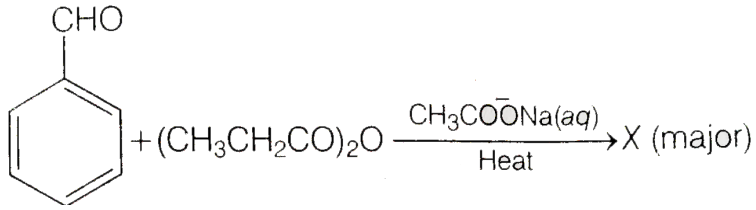
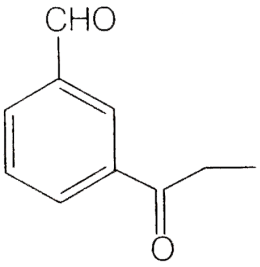
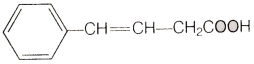
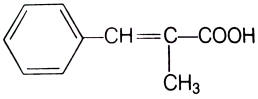
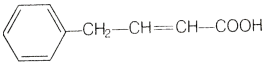
33. 

The mojor product X in the above reaction is

A. 

B. 

C. 

D. 

Answer: c

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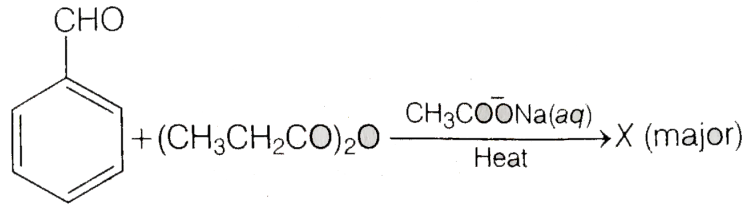
34. 

If a nitro group is introduced in the benzene ring of the starting benzaldehyde, the effect would be

A. nirto group from meta pposition would increase the reacitivity the most

B. nitro group from para position would increase the reactivity the most

C. nitro group from ortho position would increase the reactivity the most

D. nitro group from both ortho and para postion would increase the reactivity to the same extent

Answer: c

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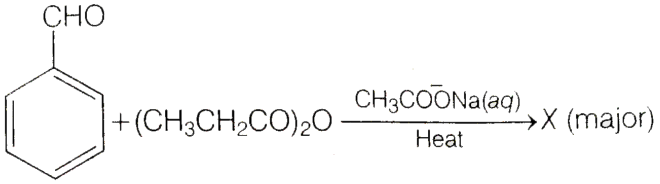
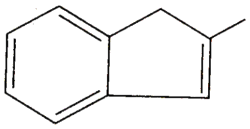
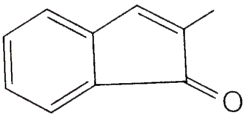
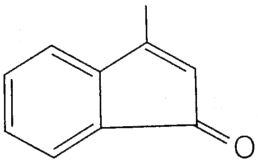
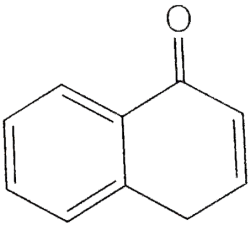
35. If the product X is treated with $SOCl_2$ followed by $AlCl_3$, the major product formed would be



A. 

B. 

C. 

D. 

Answer: b

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36. Assertion Benzaldehyde on treatment with concentrated

nictric acid in the presence of concentrated sulhuric

acid gives

mainly meta nitro benzaldehyde.

Reason The -CHO group is meta directing .

A. Both assertion and reason are correct and reason is the correct explanation of the accertion

B. Both assertion and reason are correct and reason is not the correct explanation of the accertion

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: A

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37. Assertion Benzaldehyde on heating with acetic anhydride in the presence of soidum acetate given cinnamic acid .

Reason Ther is no alpha-hydrogen in benzaldehyde.\

A. Both assertion and reason are correct and reason is the correct explanation of the accertion

B. Both assertion and reason are correct and reason is not the correct explanation of the accertion

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: b

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Others

1. Which of the following will be reduced in Cannizzaro reaction with C_6H_5CHO?

A. p-methoxy benzaldehyde

B. p-methyl benzaldehyde

C. p-methoxy benzaldehyde

D. p-aceto benzaldehyde

Answer: (c,d)

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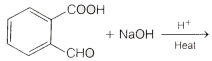
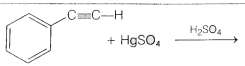
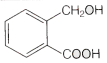
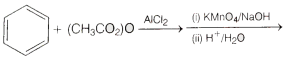
2.

	Reactions	Intermediate products/Final products
A.	$C_6H_5CHO + MnO_2 \xrightarrow{H^+}$	p. $C_6H_5COCH_3$
B.		q. C_6H_5COOH
C.		r. 
D.		s. 

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