

PYQSide

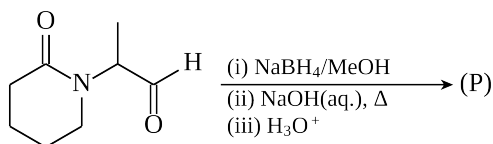
JEE MAIN ALDEHYDES, KETONES AND CARBOXYLIC ACIDS — PYQS

Max. Marks: 160

Questions: 40

Section A (MCQ)

Q.1 Consider the following reaction.



The major product (P) formed is :

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



Q.2 'x' is the product which is obtained by the hydrolysis of prop-1-yne in the presence of mercuric sulphate under dilute acidic medium at 333 K. 'y' is the product which is obtained by the reaction of ethane nitrile with methyl magnesium bromide in dry ether followed by hydrolysis. IUPAC name of product obtained from 'x' and 'y' in the presence of barium hydroxide followed by heating is :

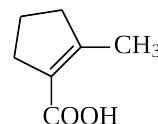
[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) 2-Methylpent-4-en-3-one
- (2) 4-Methylpent-3-en-2-one
- (3) 4-Methylpent-1-ene
- (4) 2-Methylpent-3-one

Scan or tap for the full solution



Q.3 "P" is a hydrocarbon of molecular formula: C_8H_{14} . On ozonolysis, "P" forms "Q". "Q" on treatment with alkali under reflux condition produces "R", which on treatment with $I_2/NaOH$ gives a yellow precipitate. Acidification of the solution gives "S". The structure of "S" is given below:-



The correct structure of P is

[JEE Main 2026 (Online) 5th April Morning Shift]

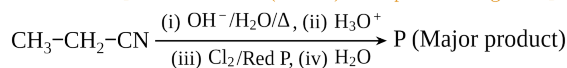
- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



Q.4 Complete the following reaction sequence and give the name of major product 'P'.

[JEE Main 2026 (Online) 5th April Evening Shift]



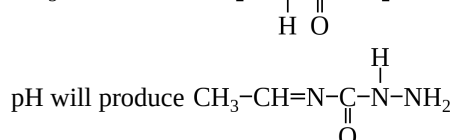
- (1) 2-Chloropropanoic acid
- (2) 3-Chloropropanoic acid
- (3) 1-Chloropropane
- (4) 2-Chloropropane

Scan or tap for the full solution



Q.5 Given below are two statements:

Statement-I: The condensation reaction between $CH_3-CH=O$ and $H_2N-NH-C(=O)-NH_2$ under optimum



Statement-II: The molecule, $\text{Ph}-\text{CH} \begin{matrix} \text{O}-\text{H} \\ \text{O}-\text{CH}_3 \end{matrix}$ will generate $\text{Ph}-\text{CH}=\text{O}$ in the presence of dilute acid.

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

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) Both Statement-I and Statement-II are true
- (2) Both Statement-I and Statement-II are false
- (3) Statement-I is true but Statement-II is false
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



Q.6 An organic compound “x” where molar ratio of C, O and H are equal, on treatment with 50% KOH under reflux followed by acidification produced “y”. The most likely structure of “y” is:
[Molar mass of ‘x’ is 58 g mol^{-1}]

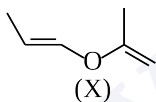
[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) $\text{CH}_2=\text{CH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$
- (2) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}=\text{O}$
- (3) $\text{O}=\text{C}-\text{OH}$
|
 CH_2-OH
- (4) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$

Scan or tap for the full solution



Q.7 A molecule (X) with following structure under mild acidic condition is hydrolysed to produce (Y) and (Z). Identify the correct statements about (Y) and (Z).



- A. Both (Y) and (Z) have same molar mass.
- B. (Y) and (Z) can be distinguished from each other by NaHCO_3 .
- C. (Y) and (Z) react with HCN with same rates.
- D. (Y) and (Z) undergo addition reaction with 2,4-DNP.

Choose the **correct** answer from the options given below :

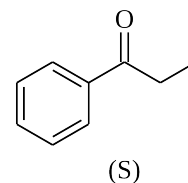
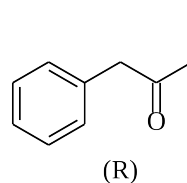
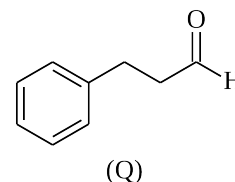
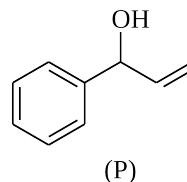
[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) A, B and C Only
- (2) B and C Only
- (3) C and D Only
- (4) A and D Only

Scan or tap for the full solution



Q.8 Given below are the four isomeric compounds (P, Q, R, S)



Identify correct statements from below.

- A. Q, R and S will give precipitate with 2,4-DNP.
 - B. P and Q will give positive Baeyer's test.
 - C. Q and R will give sooty flame.
 - D. R and S will give yellow precipitate with I_2/NaOH .
 - E. Q alone will deposit silver with Tollens' reagent.
- Choose the correct option.

[JEE Main 2026 (Online) 28th January Morning Shift]

- (1) C and E only
- (2) A and E only
- (3) A, B, D and E only
- (4) A, C and E only

Scan or tap for the full solution



Q.9 The correct order of acidic strength of the major products formed in the given reactions, is :

- A. $\text{PhNH}_2 \xrightarrow[(2) \text{ CuCN}, (3) \text{ H}_3\text{O}^+/\Delta]{(1) \text{ NaNO}_2 + \text{HCl} (< 5^\circ\text{C})} [\text{A}]$
- B. $\text{CH}_3\text{CH}_2\text{CHO} \xrightarrow[\Delta]{[\text{Ag}(\text{NH}_3)_2]^+, \text{OH}^-} [\text{B}]$
- C. $\text{CH}_4 + \text{O}_2 \xrightarrow[(ii) \text{ Na}_2\text{Cr}_2\text{O}_7/\text{H}^+]{(i) \text{ Mo}_2\text{O}_3} [\text{C}]$
- D. $\text{PhCH}_2\text{MgBr} + \text{CO}_2 \xrightarrow[\text{H}_3\text{O}^+]{\text{Dry ether}} [\text{D}]$

Choose the **correct** answer from the options given below :

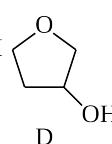
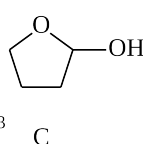
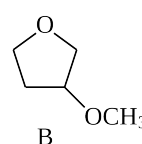
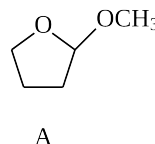
[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) $\text{C} > \text{A} > \text{D} > \text{B}$
- (2) $\text{A} > \text{D} > \text{C} > \text{B}$
- (3) $\text{A} > \text{D} > \text{B} > \text{C}$
- (4) $\text{C} > \text{B} > \text{A} > \text{D}$

Scan or tap for the full solution



Q.10 A student is given one compound among the following compounds that gives positive test with Tollens' reagent.



The compound is :

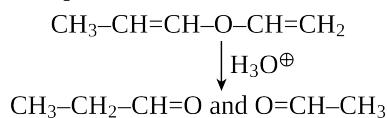
[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) B
- (2) D
- (3) A
- (4) C

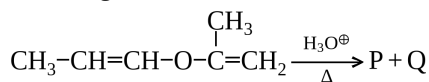
Scan or tap for the full solution



- Q.11** The unsaturated ether on acidic hydrolysis produces carbonyl compounds as shown below :-



Based on this, predict the solution/reagent that will help to distinguish "P" and "Q" obtained in the following reaction :-



[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) Saturated NaHSO_3 solution
- (2) Fehling solution
- (3) Lucas reagent
- (4) 2,4-DNP reagent

Scan or tap for the full solution



- Q.12** Given below are two statements :

Statement-I: Cross aldol condensation between two different aldehydes will always produce four different products.

Statement-II: When semicarbazide reacts with a mixture of benzaldehyde and acetophenone under optimum pH, it forms a condensation product with acetophenone only.

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

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) Statement-I is true but Statement-II is false
- (2) Both Statement-I and Statement-II are false
- (3) Both Statement-I and Statement-II are true
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution

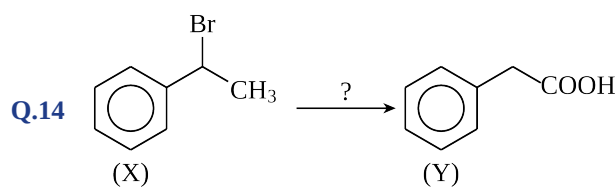


- Q.13** 'x' is the product which is obtained from propanenitrile and stannous chloride in the presence of hydrochloric acid followed by hydrolysis. 'y' is the product which is obtained from the but-2-ene by the ozonolysis followed by hydrolysis. From the following, which product is not obtained when one mole of 'x' and one mole of 'y' react with each other in the presence of alkali followed by heating?

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) 2-Methylpent-2-enal (2) 2-Methylbut-2-enal
- (3) 3-Methylbut-2-enal (4) Pent-2-enal

Scan or tap for the full solution



The correct sequence of reagents for the above conversion of X to Y is :

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) (i) NaOH(aq) , (ii) Jones reagent, (iii) H_3O^+
- (2) (i) NaOEt , (ii) $\text{B}_2\text{H}_6/\text{H}_2\text{O}_2$, (iii) Jones reagent
- (3) (i) Jones reagent, (ii) NaOEt , (iii) Hot KMnO_4/KOH
- (4) (i) $\text{B}_2\text{H}_6/\text{H}_2\text{O}_2$, (ii) NaOEt , (iii) Jones reagent

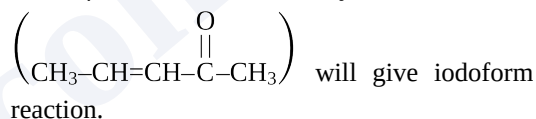
Scan or tap for the full solution



- Q.15** Which of the following statements are TRUE about Haloform reaction?

- A. Sodium hypochlorite reacts with KI to give KOI.
- B. KOI is a reducing agent.

- C. α , β -unsaturated methyl ketone



- D. Isopropyl alcohol will not give iodoform test.
 - E. Methanoic acid will give positive iodoform test.
- Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) A, B & C Only (2) A, C & E Only
- (3) B, D & E Only (4) A & C Only

Scan or tap for the full solution



- Q.16** Iodoform test can differentiate between

- A. Methanol and Ethanol
- B. CH_3COOH and $\text{CH}_3\text{CH}_2\text{COOH}$
- C. Cyclohexene and cyclohexanone
- D. Diethyl ether and Pentan-3-one
- E. Anisole and acetone

Choose the **correct** answer from the options given below :

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) A, B & E Only (2) A & D Only
- (3) A & E Only (4) B, C & E Only

Scan or tap for the full solution



- Q.17** Match the LIST-I with LIST-II

List-I Reagents		List-II Name of Reaction involving carbonyl compounds	
A.	NH_2-NH_2 , KOH	I.	Tollens' Test

List-I Reagents		List-II Name of Reaction involving carbonyl compounds	
B.	Ag(NH ₃) ₂ OH	II.	Clemmensen Reduction
C.	Aq. CuSO ₄ , Sodium Potassium tartrate, KOH	III.	Wolff-Kishner Reduction
D.	Zn-Hg, HCl	IV.	Fehling's Test

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Morning Shift]

- (1) A-IV, B-III, C-II, D-I (2) A-III, B-I, C-IV, D-II
(3) A-II, B-I, C-IV, D-III (4) A-III, B-IV, C-I, D-II

Scan or tap for the full solution



Q.18 The compound A, C₈H₈O₂ reacts with acetophenone to form a single product via cross-Aldol condensation. The compound A on reaction with conc. NaOH forms a substituted benzyl alcohol as one of the two products. The compound A is :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 2-hydroxy acetophenone
(2) 4-hydroxy benzaldehyde
(3) 4-methyl benzoic acid
(4) 4-methoxy benzaldehyde

Scan or tap for the full solution



Q.19 An organic compound "P" of molecular formula C₆H₁₂O₃ gives positive iodoform test but negative Tollens' test. When "P" is treated with dilute acid, it produces "Q". "Q" gives positive Tollens' test and also iodoform test. The structure of "P" is :

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_2-\underset{\text{OCH}_3}{\underset{|}{\text{CH}}}-\text{OCH}_3$
(2) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\underset{\text{OCH}_3}{\underset{|}{\text{CH}}}-\underset{\text{OCH}_3}{\underset{|}{\text{CH}_2}}$
(3) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\underset{\text{OCH}_3}{\underset{|}{\text{CH}}}-\text{OCH}_3$
(4) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\underset{\text{OCH}_3}{\underset{|}{\text{C}}}-\text{CH}_3$

Scan or tap for the full solution



Q.20 Match List - I with List - II.

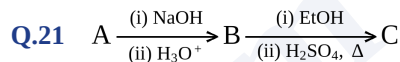
List - I Reagents		List - II Reaction Name (Involving aldehydes)	
A.	H ₂ , Pd-BaSO ₄	I.	Etard Reaction
B.	SnCl ₂ , HCl	II.	Rosenmund Reduction
C.	CrO ₂ Cl ₂ , CS ₂	III.	Gattermann-Koch Reaction
D.	CO, HCl, Anhyd. AlCl ₃	IV.	Stephen Reaction

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 21st January Evening Shift]

- (1) A-II, B-III, C-IV, D-I (2) A-IV, B-III, C-I, D-II
(3) A-IV, B-I, C-II, D-III (4) A-II, B-IV, C-I, D-III

Scan or tap for the full solution



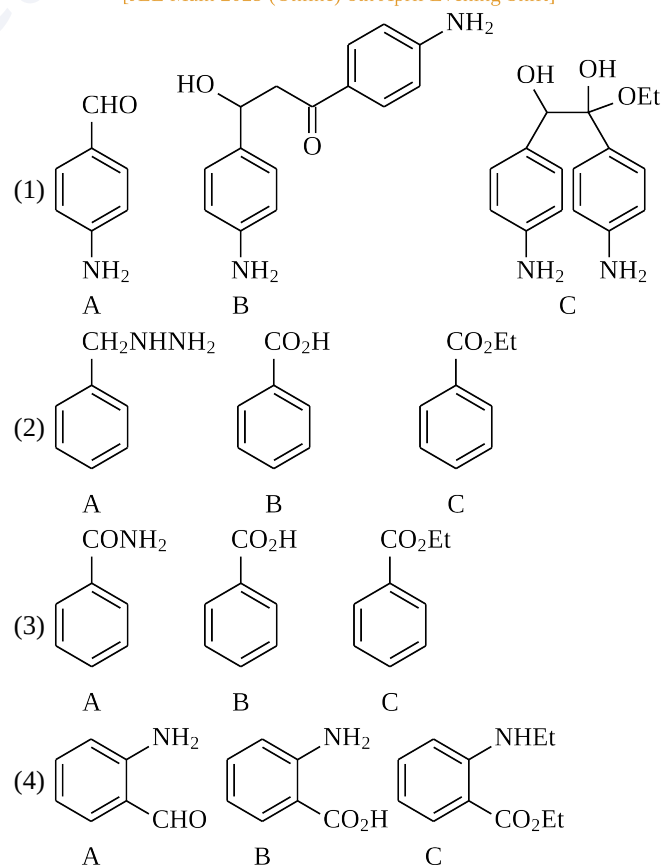
'A' shows positive Lassaigine's test for N and its molar mass is 121.

'B' gives effervescence with aq NaHCO₃.

'C' gives fruity smell.

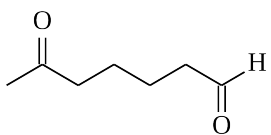
Identify A, B and C from the following.

[JEE Main 2025 (Online) 8th April Evening Shift]

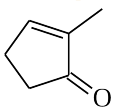
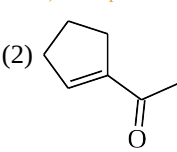
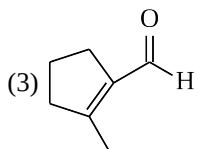
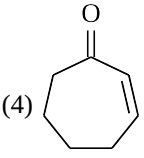


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Q.22 When  undergoes intramolecular aldol condensation, the major product formed is :

[JEE Main 2025 (Online) 8th April Evening Shift]

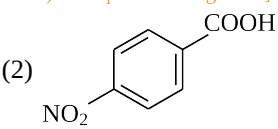
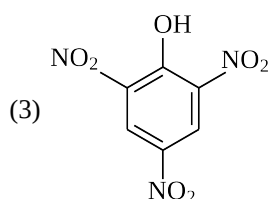
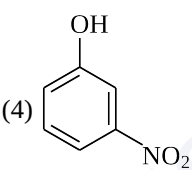
- (1)  (2) 
 (3)  (4) 

Scan or tap for the full solution



Q.23 Which of the following compounds is least likely to give effervescence of CO_2 in presence of aq. NaHCO_3 ?

[JEE Main 2025 (Online) 7th April Morning Shift]

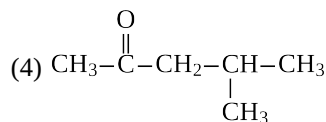
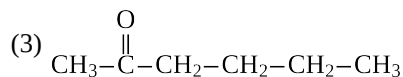
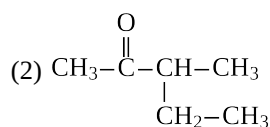
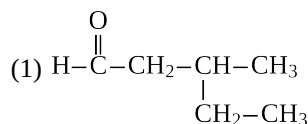
- (1) $\text{Ph}-\text{NH}_3^+\text{Cl}^-$ (2) 
 (3)  (4) 

Scan or tap for the full solution



Q.24 "P" is an optically active compound with molecular formula $\text{C}_6\text{H}_{12}\text{O}$. When "P" is treated with 2,4-dinitrophenylhydrazine, it gives a positive test. However, in presence of Tollens' reagent, "P" gives a negative test. Predict the structure of "P".

[JEE Main 2025 (Online) 7th April Evening Shift]

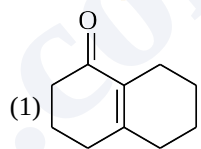
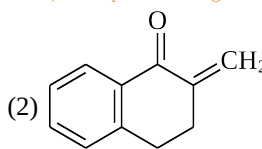
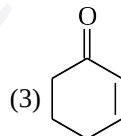
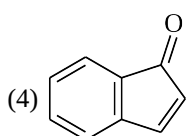


Scan or tap for the full solution



Q.25 Aldol condensation is a popular and classical method to prepare α , β -unsaturated carbonyl compounds. This reaction can be both intermolecular and intramolecular. Predict which one of the following is not a product of intramolecular aldol condensation?

[JEE Main 2025 (Online) 4th April Morning Shift]

- (1)  (2) 
 (3)  (4) 

Scan or tap for the full solution



Q.26 Which among the following compounds give yellow solid when reacted with NaOI/NaOH ?

- A. $\text{CH}_3-\overset{\text{OH}}{\text{CH}}-\text{C}_2\text{H}_5$ B. $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{OH}$
 C. $\text{CH}_3-\overset{\text{O}}{\text{C}}-\text{C}_2\text{H}_5$ D. $\text{CH}_3-\overset{\text{O}}{\text{C}}-\text{OH}$
 E. $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\text{C}}-\text{H}$

Choose the correct answer from the options given below :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) (A) and (C) Only (2) (C) and (D) Only
 (3) (B), (C) and (E) Only (4) (A), (C) and (D) Only

Scan or tap for the full solution



Q.27 Number of molecules from below which cannot give iodoform reaction is :

Ethanol, Isopropyl alcohol, Bromoacetone, 2-Butanol, 2-Butanone, Butanal, 2-Pentanone, 3-Pentanone, Pentanal and 3-Pentanol.

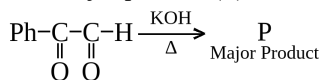
[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 4 (2) 3 (3) 5 (4) 2

Scan or tap for the full solution



Q.28 The major product (P) in the following reaction is :



[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) $\text{Ph}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{COO}^{\ominus} \text{K}^{\oplus}$
 $\quad \quad \quad \text{OH}$
 $\quad \quad \quad |$
 (2) $\text{Ph}-\text{CH}-\text{CH}_2\text{OH}$
 (3) $\text{Ph}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{H}-\text{COO}^{\ominus} \text{K}^{\oplus}$
 $\quad \quad \quad |$
 $\quad \quad \quad \text{OH}$
 (4) $\text{Ph}-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{CH}_2\text{OH}$

Scan or tap for the full solution



Q.29 Given below are two statements:

Statement-I: Vanillin $\left(\text{HO}-\text{C}_6\text{H}_4-\text{CHO} \right)$ will react with NaOH and also with Tollens' reagent.

Statement-II: Vanillin $\left(\text{HO}-\text{C}_6\text{H}_4-\text{CHO} \right)$ will undergo self aldol condensation very easily.

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

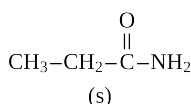
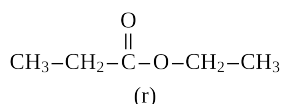
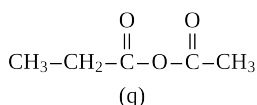
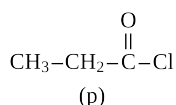
[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) Statement-I is correct but Statement-II is incorrect
 (2) Both Statement-I and Statement-II are correct
 (3) Both Statement-I and Statement-II are incorrect
 (4) Statement-I is incorrect but Statement-II is correct

Scan or tap for the full solution



Q.30 Consider the following molecules:



The correct order of rate of hydrolysis is :

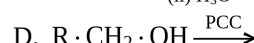
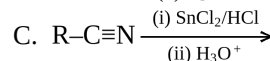
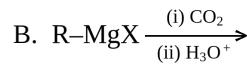
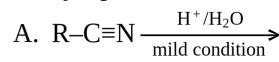
[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) $p > q > r > s$ (2) $r > q > p > s$
 (3) $p > r > q > s$ (4) $q > p > r > s$

Scan or tap for the full solution



Q.31 Consider the following reactions. From these reactions which reaction will give carboxylic acid as a major product?



Choose the correct answer from the options given below: [JEE Main 2025 (Online) 2nd April Evening Shift]

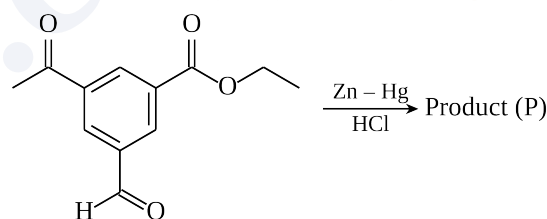
- (1) A, B and E only (2) A and D only
 (3) B, C and E only (4) B and E only

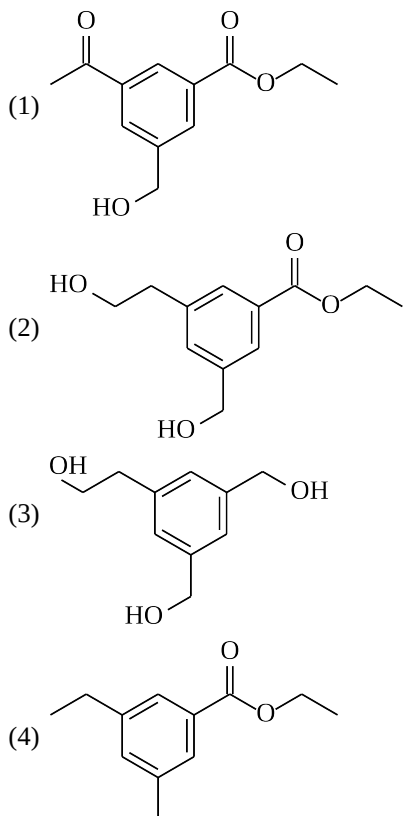
Scan or tap for the full solution



Q.32 The product (P) formed in the following reaction is :

[JEE Main 2025 (Online) 29th January Morning Shift]





Scan or tap for the full solution



Q.33 Both acetaldehyde and acetone (individually) undergo which of the following reactions?

- A. Iodoform Reaction
- B. Cannizzaro Reaction
- C. Aldol Condensation
- D. Tollens' Test
- E. Clemmensen Reduction

Choose the correct answer from the options given below:

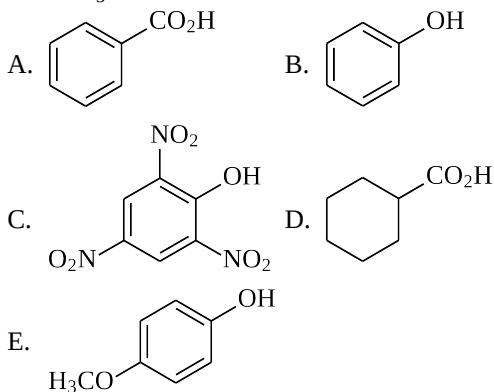
[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) C and E Only (2) A, B and D Only
(3) A, C and E Only (4) B, C and D Only

Scan or tap for the full solution



Q.34 The compounds that produce CO_2 with aqueous NaHCO_3 solution are:



Choose the correct answer from the options given below:

[JEE Main 2025 (Online) 28th January Morning Shift]

(1) A and C Only

(2) A, B and E Only

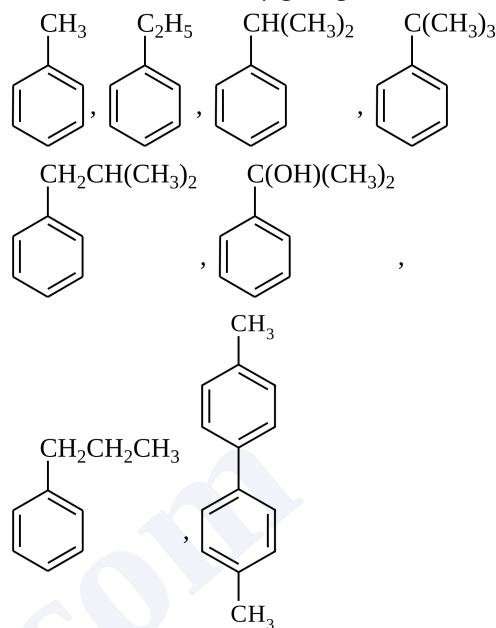
(3) A and B Only

(4) A, C and D Only

Scan or tap for the full solution



Q.35 The total number of compounds from below when treated with hot KMnO_4 , giving benzoic acid is:



[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) 4 (2) 3 (3) 5 (4) 6

Scan or tap for the full solution



Section B (Numerical)

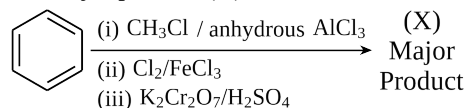
Q.36 'x' is the product which is obtained from benzene by reacting it with carbon monoxide and hydrogen chloride in the presence of cuprous chloride. 'y' is the major product obtained from the benzene by reacting it with ethanoyl chloride in the presence of anhydrous AlCl_3 . Product (major) obtained by heating x and y in the presence of alkali is z. Total number of π (pi) electrons in z is _____.

[JEE Main 2026 (Online) 8th April Evening Shift]

Scan or tap for the full solution



Q.37 Consider the following sequence of reactions to give the major product (X)



P g of the major product (X) formed is reacted with NaHCO_3 solution to liberate a gas which occupied 11.2 dm^3 at STP.

P = _____ g.

(Given molar mass in g mol^{-1} H : 1, C : 12, O : 16, Cl : 35.5)

[JEE Main 2026 (Online) 4th April Morning Shift]

Scan or tap for the full solution



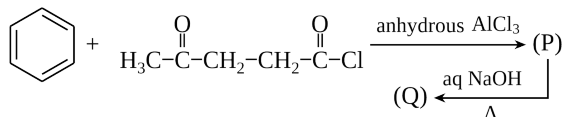
- Q.38** Grignard reagent RMgBr (P) reacts with water and forms a gas (Q). One gram of Q occupies 1.4 dm^3 at STP. (P) on reaction with dry ice in dry ether followed by H_3O^+ forms a compound (Z). 0.1 mole of (Z) will weigh _____ g. (Nearest integer)

[JEE Main 2026 (Online) 24th January Evening Shift]

Scan or tap for the full solution



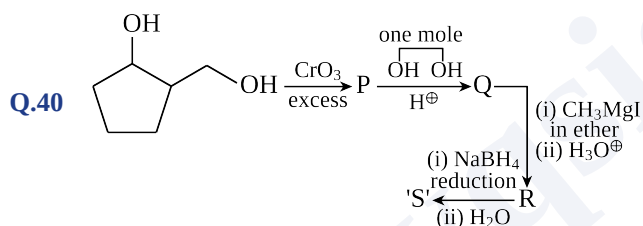
- Q.39** Consider the following reaction of benzene.



In compound (Q), the percentage of oxygen is _____ %. (Nearest integer)

[JEE Main 2026 (Online) 23rd January Evening Shift]

Scan or tap for the full solution



0.1 mole of compound 'S' will weigh _____ g.
(Given molar mass in g mol^{-1} C : 12, H : 1, O : 16)

[JEE Main 2025 (Online) 29th January Morning Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	2	4	1	4	3	4	4	1	4	2
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	2	3	2	4	3	2	4	3	4	3	2
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	4	2	2	1	1	3	1	1	4	4	3
Ques.	34	35									
Ans.	4	3									

Section B (Numerical)

Ques.	36	37	38	39	40						
Ans.	16	78	6	10	13						