

## JEE MAIN ALDEHYDES, KETONES AND CARBOXYLIC ACIDS — ALDOL CONDENSATION OF ALDEHYDES AND KETONES — PYQS

Max. Marks: 40

Questions: 10

### Section A (MCQ) — 8 questions

- Q.1** '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 :

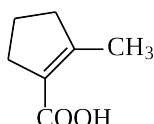
[JEE Main 2026 (Online) 6th April Evening Shift]

- (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

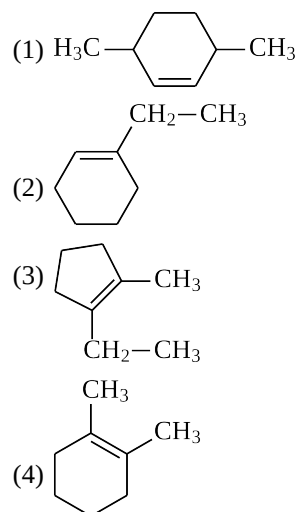


- Q.2** "P" is a hydrocarbon of molecular formula:  $C_8H_{14}$ . On ozonolysis, "P" forms "Q". "Q" on treatment with alkali under reflux condition produces "R", which on treatment with  $I_2/NaOH$  gives a yellow precipitate. Acidification of the solution gives "S". The structure of "S" is given below:-



The correct structure of P is

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



Scan or tap for the full solution



- Q.3** 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.4** '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?

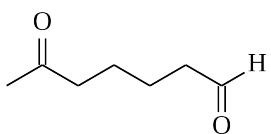
[JEE Main 2026 (Online) 23rd January Morning Shift]

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

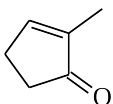
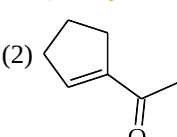
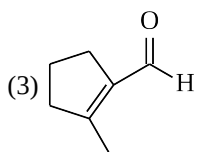
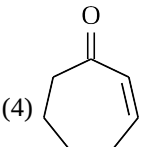
Scan or tap for the full solution



**Q.5**

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

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

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

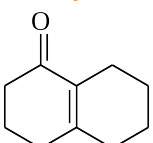
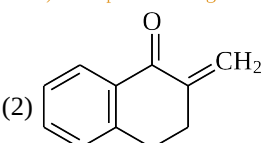
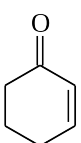
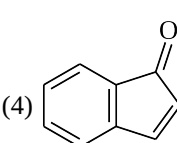
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**Q.6**

Aldol condensation is a popular and classical method to prepare  $\alpha$ ,  $\beta$ -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) 

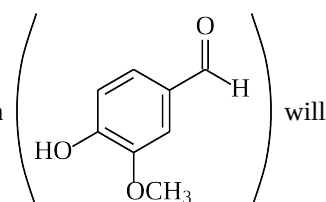
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**Q.7**

Given below are two statements:

**Statement-I:** Vanillin

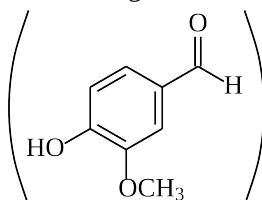


will

react with NaOH and also with Tollens' reagent.

**Statement-II:** Vanillin

Vanillin



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.8**

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



## Section B (Numerical) — 2 questions

**Q.9**

'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  $\text{AlCl}_3$ . Product (major) obtained by heating x and y in the presence of alkali is z. Total number of  $\pi$  (pi) electrons in z is \_\_\_\_\_.

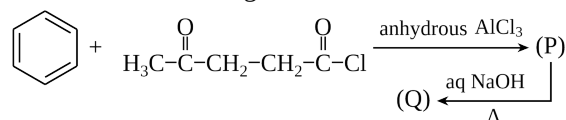
[JEE Main 2026 (Online) 8th April Evening Shift]

Scan or tap for the full solution



**Q.10**

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



**ANSWER KEY****Section A (MCQ) — 8 questions**

|              |   |   |   |   |   |   |   |   |  |  |  |
|--------------|---|---|---|---|---|---|---|---|--|--|--|
| <b>Ques.</b> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |
| <b>Ans.</b>  | 2 | 4 | 2 | 3 | 2 | 2 | 1 | 3 |  |  |  |

**Section B (Numerical) — 2 questions**

|              |    |    |  |  |  |  |  |  |  |  |  |
|--------------|----|----|--|--|--|--|--|--|--|--|--|
| <b>Ques.</b> | 9  | 10 |  |  |  |  |  |  |  |  |  |
| <b>Ans.</b>  | 16 | 10 |  |  |  |  |  |  |  |  |  |