

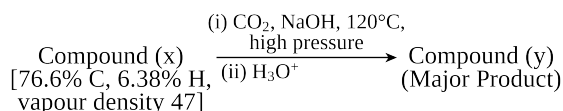
## JEE MAIN ALCOHOLS, PHENOLS AND ETHERS — REACTIONS OF PHENOLS — PYQS

Max. Marks: 64

Questions: 16

### Section A (MCQ) — 13 questions

**Q.1** Consider the following reaction sequence :



Compound (y) develops characteristic colour with neutral  $\text{FeCl}_3$  solution.

Identify the **INCORRECT** statement from the following for the above sequence.

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

- (1) Compound y will dissolve in  $\text{NaHCO}_3$  and evolve a gas.
- (2) Compound x is more acidic than compound y.
- (3) Both compounds x and y will dissolve in  $\text{NaOH}$ .
- (4) Both compounds x and y will burn with sooty flame.

Scan or tap for the full solution



**Q.2** Given below are two statements :

**Statement-I:** Phenol on treatment with  $\text{CHCl}_3/\text{aq. KOH}$  under refluxing condition, followed by acidification produces p-hydroxybenzaldehyde as the major product and o-hydroxybenzaldehyde as the minor product.

**Statement-II:** The mixture of p-hydroxybenzaldehyde and o-hydroxybenzaldehyde can be easily separated through steam distillation.

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

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

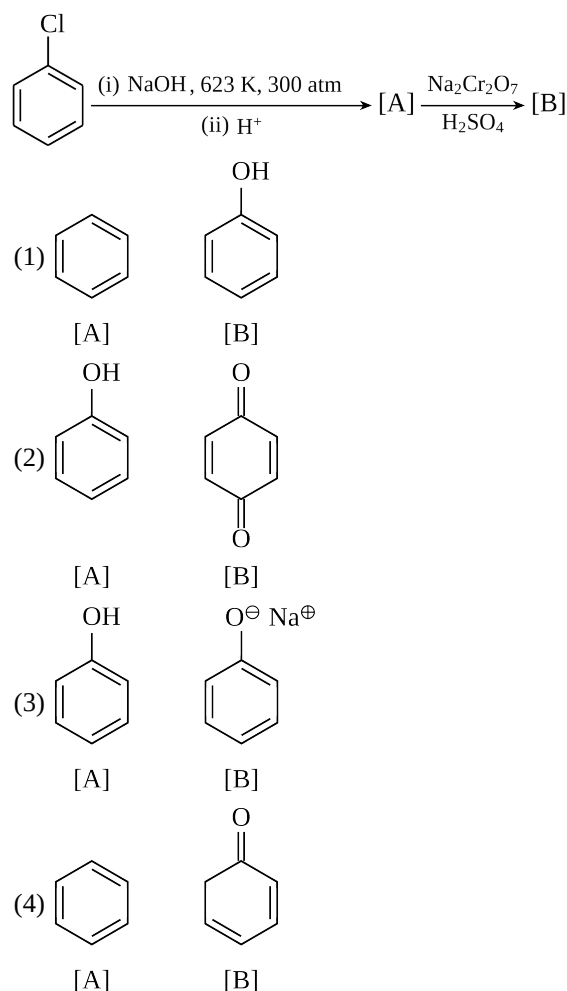
- (1) Statement-I is true but Statement-II is false
- (2) Both Statement-I and Statement-II are true
- (3) Both Statement-I and Statement-II are false
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



**Q.3** Identify the products [A] and [B], respectively in the following reaction:

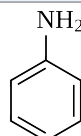
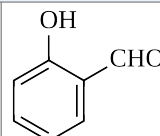
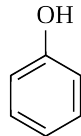
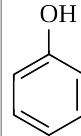
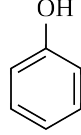
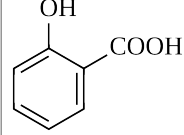
[JEE Main 2025 (Online) 23rd January Evening Shift]



Scan or tap for the full solution



**Q.4** Match List I with List II

|    | List – I<br>(Reactions)                                                                                                                                           |      | List – II<br>(Products)                                                               |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------|
| A. |  $\xrightarrow[\text{(ii) H}_2\text{O, warm}]{\text{(i) NaNO}_2 + \text{HCl}}$ | I.   |  |
| B. |  $\xrightarrow[\text{H}_2\text{SO}_4]{\text{Na}_2\text{Cr}_2\text{O}_7}$       | II.  |  |
| C. |  $\xrightarrow[\text{(ii) H}^+]{\text{(i) CHCl}_3 + \text{aq NaOH}}$           | III. |  |

| List – I<br>(Reactions) |                                                                                            | List – II<br>(Products) |  |
|-------------------------|--------------------------------------------------------------------------------------------|-------------------------|--|
| D.                      | $\text{C}_6\text{H}_5\text{OH} \xrightarrow[\text{(iii) H}^+]{\text{(i) NaOH, (ii) CO}_2}$ | IV.                     |  |

Choose the correct answer from the options given below : [JEE Main 2024 (Online) 8th April Evening Shift]

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

Scan or tap for the full solution



**Q.5** In Reimer - Tiemann reaction, phenol is converted into salicylaldehyde through an intermediate. The structure of intermediate is \_\_\_\_\_.

[JEE Main 2024 (Online) 6th April Morning Shift]

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

Scan or tap for the full solution



**Q.6** Given below are two statements :  
**Statement-I:** Picric acid is 2,4,6 - trinitrotoluene.  
**Statement-II:** Phenol - 2,4 - disulphonic acid is treated with Conc.  $\text{HNO}_3$  to get picric acid.

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

[JEE Main 2024 (Online) 6th April Morning Shift]

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

Scan or tap for the full solution



**Q.7** Given below are two statements :  
**Statement-I:** Bromination of phenol in solvent with low polarity such as  $\text{CHCl}_3$  or  $\text{CS}_2$  requires Lewis acid catalyst.  
**Statement-II:** The Lewis acid catalyst polarises the bromine to generate  $\text{Br}^+$ .

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

[JEE Main 2024 (Online) 5th April Morning Shift]

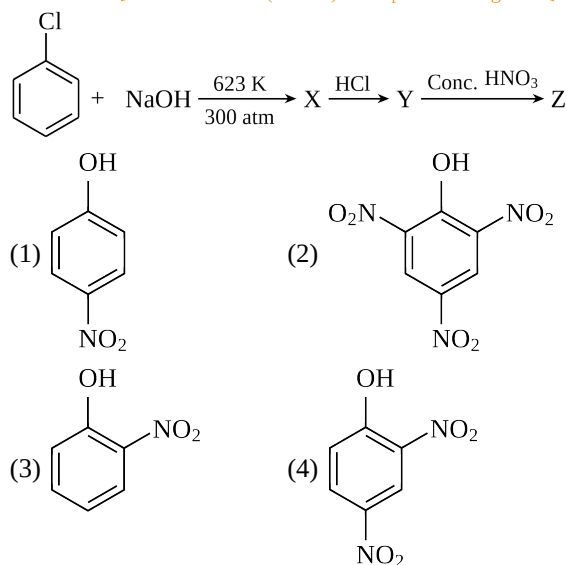
- (1) Statement-I is true but Statement-II is false  
 (2) Both Statement-I and Statement-II are true  
 (3) Statement-I is false but Statement-II is true  
 (4) Both Statement-I and Statement-II are false

Scan or tap for the full solution



**Q.8** Identify compound (Z) in the following reaction sequence.

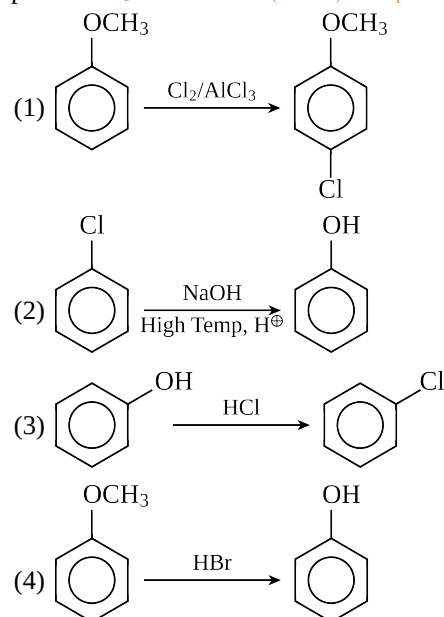
[JEE Main 2024 (Online) 5th April Morning Shift]



Scan or tap for the full solution



**Q.9** Which one of the following reactions is NOT possible? [JEE Main 2024 (Online) 5th April Evening Shift]



Scan or tap for the full solution



**Q.10** Match List - I with List - II.

| List I<br>(Reactants) |                                     | List II<br>(Product) |                 |
|-----------------------|-------------------------------------|----------------------|-----------------|
| A.                    | Phenol, Zn/ $\Delta$                | I.                   | Salicylaldehyde |
| B.                    | Phenol, $\text{CHCl}_3$ , NaOH, HCl | II.                  | Salicylic acid  |
| C.                    | Phenol, $\text{CO}_2$ , NaOH, HCl   | III.                 | Benzene         |
| D.                    | Phenol, Conc. $\text{HNO}_3$        | IV.                  | Picric acid     |

Choose the correct answer from the options given below :

[JEE Main 2024 (Online) 1st February Evening Shift]

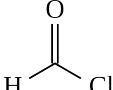
- (1) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)  
 (2) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)  
 (3) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)  
 (4) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Scan or tap for the full solution



**Q.11** Salicylaldehyde is synthesized from phenol, when reacted with

[JEE Main 2024 (Online) 30th January Evening Shift]

- (1)  $\text{HCCl}_3$ , NaOH      (2)  $\text{CO}_2$ , NaOH  
 (3)  , NaOH      (4)  $\text{CCl}_4$ , NaOH

Scan or tap for the full solution



**Q.12** Phenol treated with chloroform in presence of sodium hydroxide, which further hydrolyzed in presence of an acid results

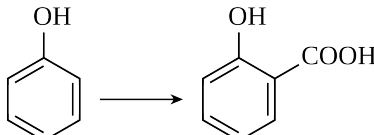
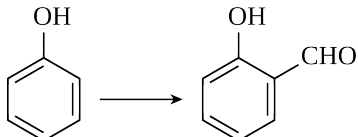
[JEE Main 2024 (Online) 29th January Evening Shift]

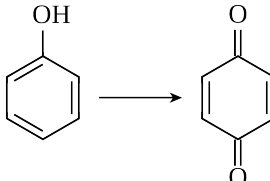
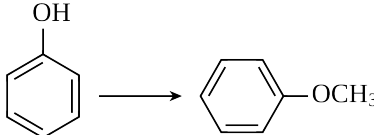
- (1) Salicylic acid  
 (2) Benzene-1,2-diol  
 (3) 2-Hydroxybenzaldehyde  
 (4) Benzene-1,3-diol

Scan or tap for the full solution



**Q.13** Match List - I with List - II.

| List - I<br>(Reaction) |                                                                                     |
|------------------------|-------------------------------------------------------------------------------------|
| A.                     |  |
| B.                     |  |

| List - I<br>(Reaction) |                                                                                    |
|------------------------|------------------------------------------------------------------------------------|
| C.                     |  |
| D.                     |  |

| List - II<br>(Reagent(s)) |                                                              |
|---------------------------|--------------------------------------------------------------|
| I.                        | $\text{Na}_2\text{Cr}_2\text{O}_7$ , $\text{H}_2\text{SO}_4$ |
| II.                       | (i) NaOH, (ii) $\text{CH}_3\text{Cl}$                        |
| III.                      | (i) NaOH, $\text{CHCl}_3$ , (ii) NaOH, (iii) HCl             |
| IV.                       | (i) NaOH, (ii) $\text{CO}_2$ , (iii) HCl                     |

Choose the correct answer from the options given below :

[JEE Main 2024 (Online) 27th January Evening Shift]

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

Scan or tap for the full solution



### Section B (Numerical) — 3 questions

**Q.14** 4.7 g of phenol is heated with Zn to give product X. If this reaction goes to 60% completion then the number of moles of compound X formed will be \_\_\_\_\_  $\times 10^{-2}$ . (Nearest Integer)  
 (Given molar mass in  $\text{g mol}^{-1}$  : H:1, C:12, O:16)

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

Scan or tap for the full solution

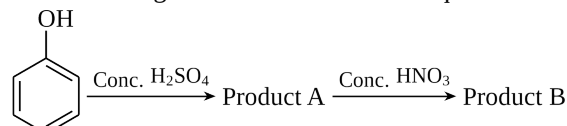


**Q.15** One mole of phenol is treated with dilute  $\text{HNO}_3$  at 298 K to give a mixture of products. The mixture is separated by steam distillation. The steam volatile compound (X) is separated. The increase in percentage of oxygen in (X) with respect to phenol is \_\_\_\_\_  $\times 10^{-1}\%$   
 (Given molar mass in  $\text{g mol}^{-1}$  : H : 1, C : 12, N : 14, O : 16) [JEE Main 2026 (Online) 5th April Morning Shift]

Scan or tap for the full solution



**Q.16** Consider the given chemical reaction sequence :



Total sum of oxygen atoms in Product A and Product B is \_\_\_\_\_.

[JEE Main 2024 (Online) 5th April Morning Shift]

Scan or tap for the  
full solution



## ANSWER KEY

### Section A (MCQ) — 13 questions

|       |    |    |   |   |   |   |   |   |   |    |    |
|-------|----|----|---|---|---|---|---|---|---|----|----|
| Ques. | 1  | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Ans.  | 2  | 4  | 2 | 1 | 2 | 1 | 3 | 2 | 3 | 2  | 1  |
| Ques. | 12 | 13 |   |   |   |   |   |   |   |    |    |
| Ans.  | 3  | 3  |   |   |   |   |   |   |   |    |    |

### Section B (Numerical) — 3 questions

|       |    |     |    |  |  |  |  |
|-------|----|-----|----|--|--|--|--|
| Ques. | 14 | 15  | 16 |  |  |  |  |
| Ans.  | 3  | 175 | 14 |  |  |  |  |