

**TEST INFORMATION**

DATE : 26.04.2015

CUMULATIVE TEST (CT) - 02

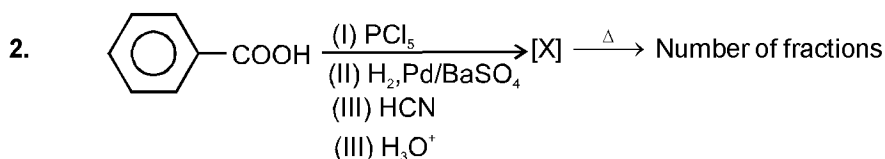
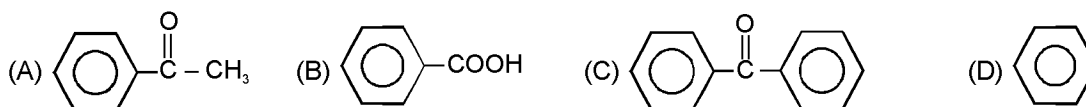
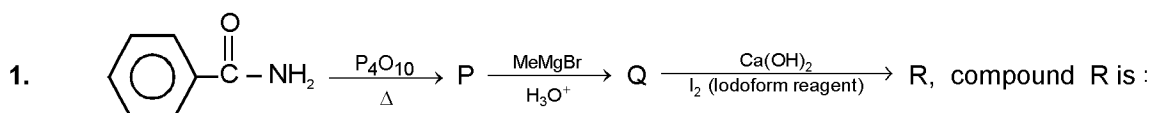
**Syllabus : Physical :** Mole concept, Equivalent Concept, Ionic equilibrium, Electrochemistry. **Inorganic:** Inorganic Nomenclature, Periodic table, Chemical bonding, Coordination compounds, s & p Block Element, Metallurgy. **Organic :** Organic Nomenclature, Isomerism, Stereoisomerism, GOC, POC, Tautomerism, Acids & Bases.

**DPP No. # 06 (JEE-ADVANCED)**

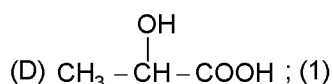
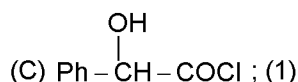
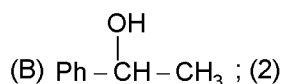
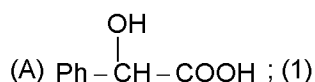
Total Marks : 169

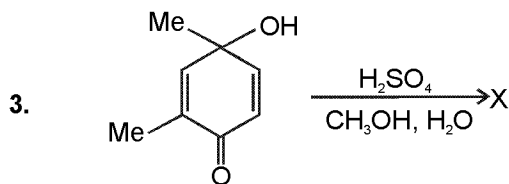
Max. Time : 137 min.

Single choice Objective (–1 negative marking) Q.1 to Q.15	(3 marks 2½ min.)	[45, 37½]
Multiple choice objective (–1 negative marking) Q.16 to Q.20	(4 marks, 3 min.)	[20, 15]
Assertion and Reason ('–1' negative marking) Q.21 to Q.23	(3 marks 2½ min.)	[09, 7½]
Comprehension (–1 negative marking) Q.24 to Q.32	(3 marks 2½ min.)	[27, 22½]
Single Digit Subjective Questions (no negative marking) Q.33 to Q.40	(4 marks 2½ min.)	[32, 20]
Double Digits Subjective Questions (no negative marking) Q.41	(4 marks 2½ min.)	[04, 2½]
Match the column (4 vs 4) (no negative marking) Q.42 to Q.43	(8 marks, 8 min.)	[16, 16]
Match the column (4 vs 5) (no negative marking) Q.44 to Q.45	(8 marks, 8 min.)	[16, 16]

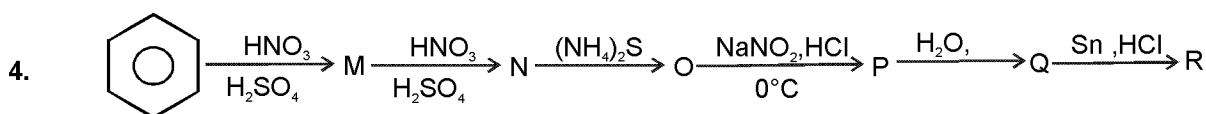
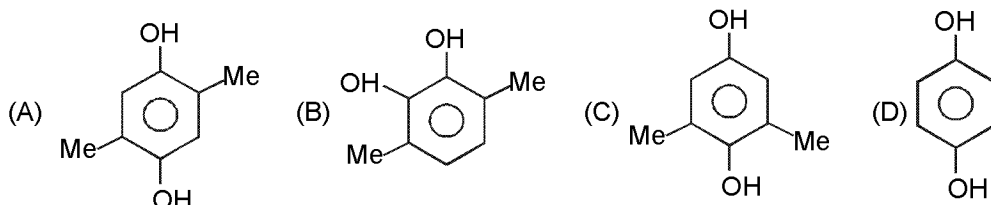


Find X &amp; total number of fractions :

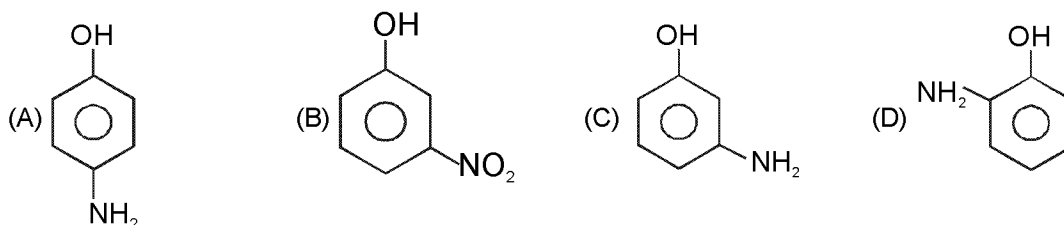




X is :



R is :



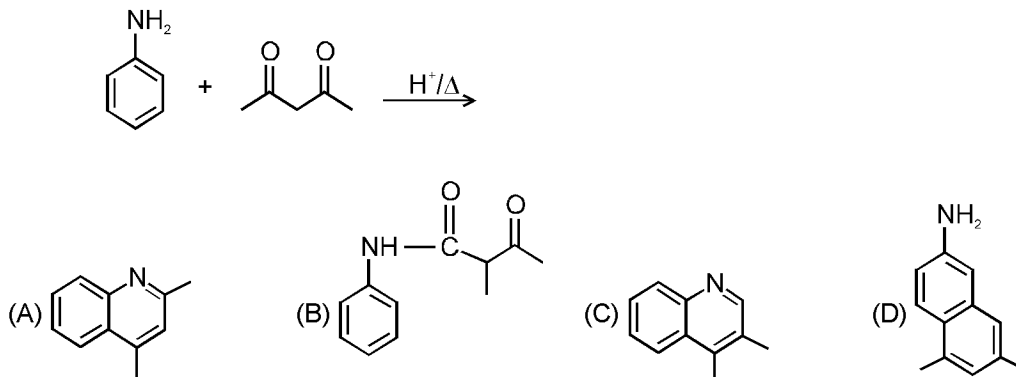
5. Compound A ( $C_{10}H_{14}O$ ) does not react with  $Br_2$  water, acetyl chloride or boiling  $NaOH$  solution. On reaction with excess of  $HI$ , A is converted into B ( $C_3H_7I$ ) and C ( $C_7H_7I$ ). B can be hydrolysed by aq.  $NaOH$  to D ( $C_3H_8O$ ) which gives iodoform test. C can be oxidized to carboxylic acid E ( $C_7H_6O_2$ ) by chromic acid. Assign structures to A.



6. A mixture of two aromatic compounds (A) and (B) was separated by dissolving in chloroform followed by extraction with aqueous  $KOH$  solution. The organic layer containing compound (A) when heated with alcoholic solution of  $KOH$  produced a compound C ( $C_7H_5N$ ), associated with an unpleasant odour. The alkaline aqueous layer on the other hand, when heated with chloroform and then acidified gave a mixture of two isomeric compounds (D) and (E) of molecular formula  $C_7H_6O_2$ . Identify (A).

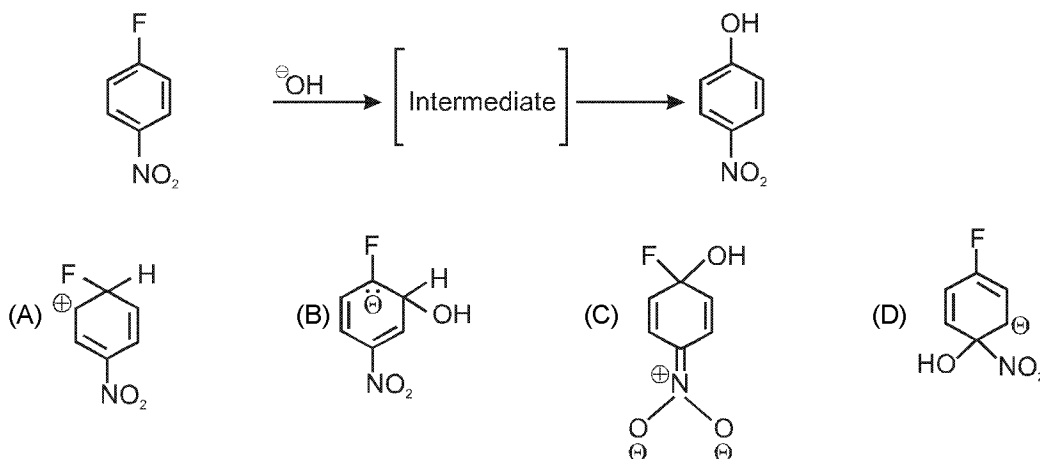


7. Which can be the product of the following reaction ?

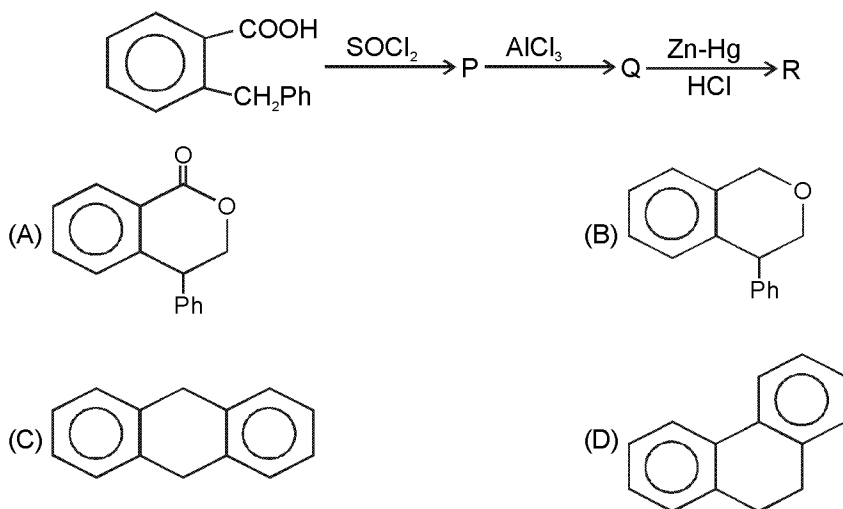


8.  $S_1$  : Diazocoupling in aniline is carried out in slightly acidic medium.  
 $S_2$  : Carbonyl compounds undergo electrophilic as well as nucleophilic addition reaction.  
 $S_3$  : Secondary amines give insoluble precipitate with aqueous alkaline  $\text{PhSO}_2\text{Cl}$ .  
 $S_4$  : Benzaldehyde reacts faster with grignard reagent than benzene-1,2-dicarbaldehyde.  
 (A) FTFT (B) TTFT (C) TTTF (D) TFTF

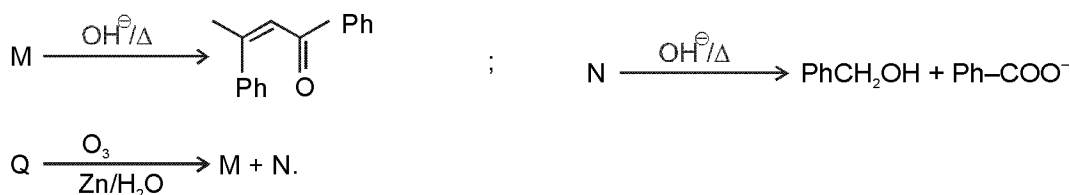
9. The intermediate of the following reaction is :



10. Consider the following sequence of reaction and identify the end product(R) :



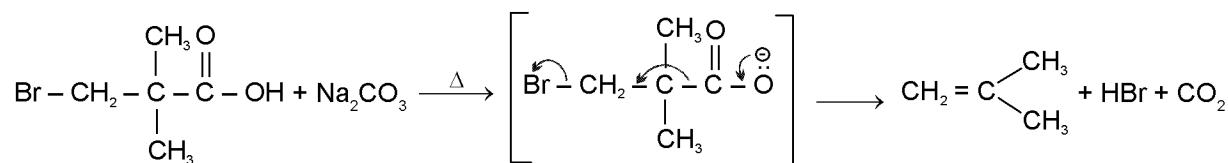
11. In the following sequence of reactions;



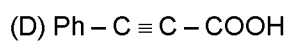
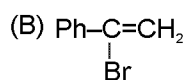
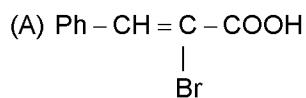
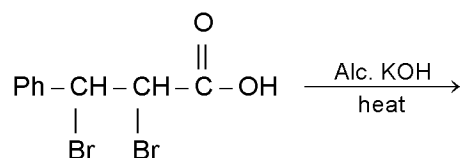
The compound Q is :

- (A)  $\text{Ph}-\text{CH}_2-\text{CH}=\text{CH}-\text{Ph}$ 
 (B) 
 (C) 
 (D)  $\text{Ph}-\text{CH}=\text{CH}-\text{Ph}$

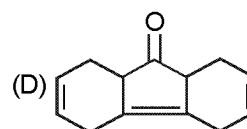
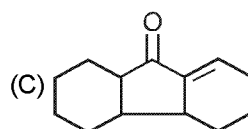
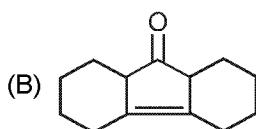
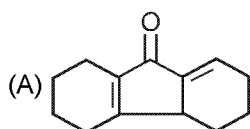
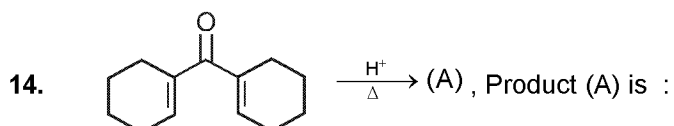
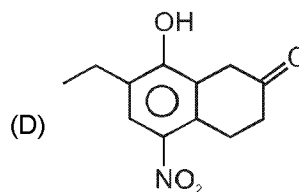
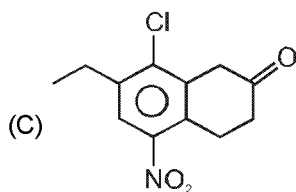
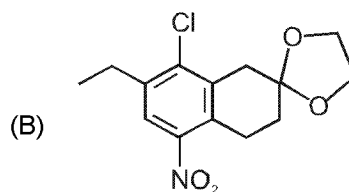
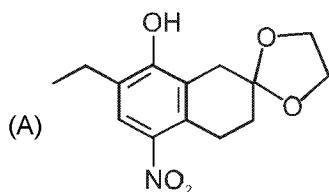
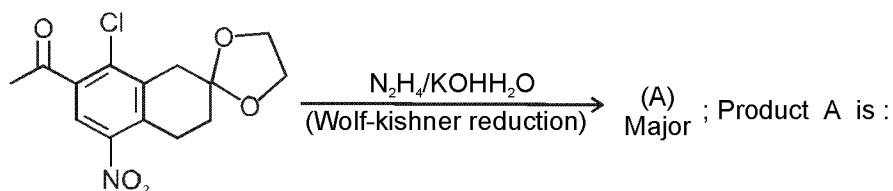
12. Observe the following reaction;

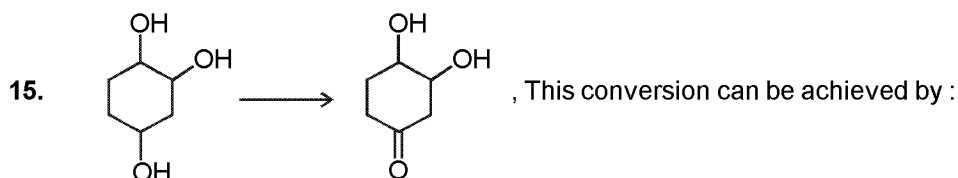


What will be the product of following given reaction ?



13. Predict the major product of given reaction.



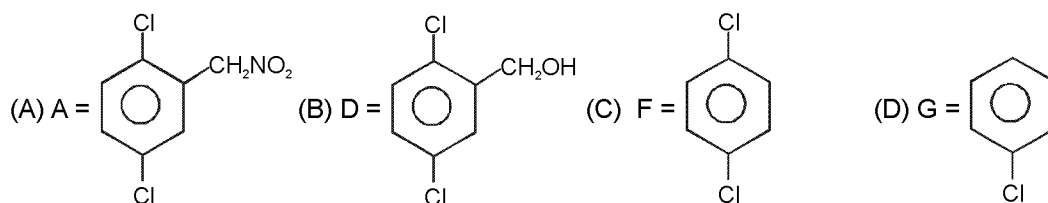
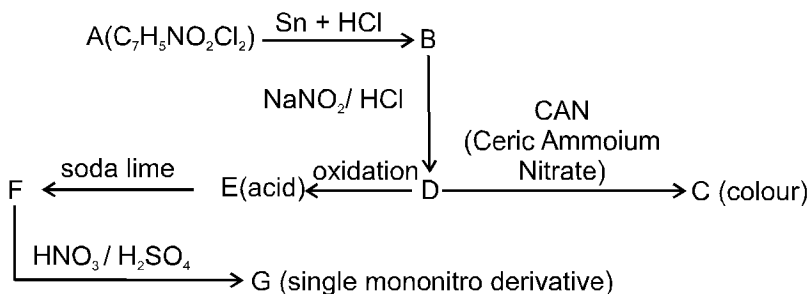


- (A)  $\text{Me}_2\text{CO}/\text{H}^+$ ,  $\text{H}_3\text{O}^+$ ,  $\text{KMnO}_4/\text{HO}^-$  (B)  $\text{Me}_2\text{CO}/\text{H}^+$ ,  $\text{KMnO}_4$ ,  $\text{H}_3\text{O}^+$   
 (C)  $\text{KMnO}_4/\text{NaO}_4$ ,  $\text{Me}_2\text{CO}/\text{H}^+$ ,  $\text{H}_3\text{O}^+$  (D)  $\text{KMnO}_4/\text{NaO}_4$ ,  $\text{H}_3\text{O}^+$ ,  $\text{Me}_2\text{CO}/\text{H}^+$

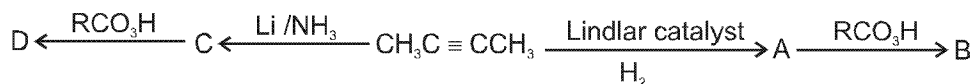
16.\* Compound A ( $\text{C}_5\text{H}_7\text{OCl}$ ) reacts rapidly with ethanol and catalytic amount of acid to form a pleasant smelling substance, B ( $\text{C}_7\text{H}_{12}\text{O}_2$ ). A also reacts with  $\text{H}_2\text{O}$  to form C with neutralisation equivalent of 100. A, B and C all react with  $\text{Br}_2$  water. Acid C, which can also be obtained by acidic hydrolysis of B is oxidised to new acid D ( $\text{C}_4\text{H}_6\text{O}_3$ ) and  $\text{CO}_2$ . D on heating with soda lime gives acetone. Identify A to D.

- (A)  $\text{A} = \text{CH}_3 - \underset{\text{CH}_2}{\underset{\text{||}}{\text{C}}} - \text{CH}_2 - \underset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{Cl}$  (B)  $\text{B} = \text{CH}_3 - \underset{\text{CH}_2}{\underset{\text{||}}{\text{C}}} - \text{CH}_2 - \underset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{OEt}$   
 (C)  $\text{C} = \text{CH}_3 - \underset{\text{CH}_2}{\underset{\text{||}}{\text{C}}} - \text{CH}_2 - \underset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{COOH}$  (D)  $\text{D} = \text{CH}_3 - \underset{\text{O}}{\underset{\text{||}}{\text{C}}} - \text{CH}_2 - \text{COOH}$

17.\* Identify A, B, C, D, E and F in the following :

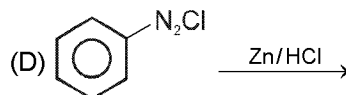
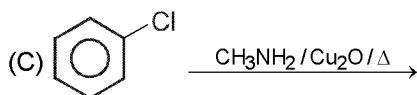
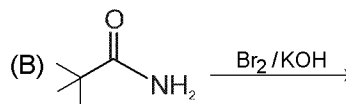
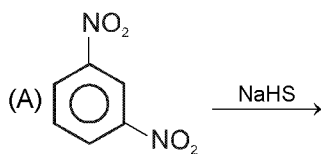


18.\* Identify A, B, C, and D in the following :

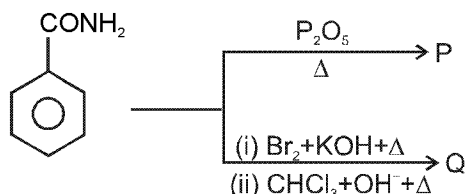


- (A) D is Cis (B) D is trans (C) B is Cis (D) B is trans

19. Primary ( $1^\circ$ ) amine group is formed in :



20.



Which statement(s) is/are correct :

- (A) Reduced product of P and Q will be metamers to each other.
- (B) By dry distillation of hydrolysed products of P with  $\text{Ca}(\text{OH})_2$ , gives benzophenone.
- (C) Hydrolysed product of Q, reacts with  $\text{NaNO}_2 + \text{HCl}$  followed by reaction with phenol, gives orange red dye.
- (D) Electrophile involved in the formation of Q is dichlorocarbene.

21. **Statement-1** :  $\text{NaHSO}_3$  is used in separation and purification of aldehydes.

**Statements-2** :  $\text{NaHSO}_3$  is reducing agent.

- (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
- (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.
- (C) Statement-1 is True, Statement-2 is False.
- (D) Statement-1 is False, Statement-2 is True.

22. **Statement-1** :  $\text{CCl}_3\text{CHO}$  forms an isolable crystalline hydrate.

**Statement-2** : Electron withdrawing chlorine atoms stabilise hydrate by intramolecular H-bonding.

- (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
- (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.
- (C) Statement-1 is True, Statement-2 is False.
- (D) Statement-1 is False, Statement-2 is True.

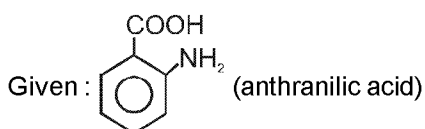
23. **Statement-1** :  $\text{CH}_3\text{MgBr}$  can not be prepared in cold aqueous solution.

**Statement-2** : Water molecules stabilise grignard molecules by H-bonding.

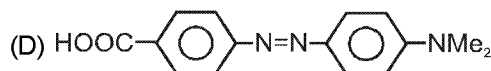
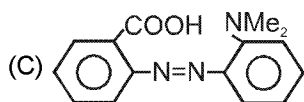
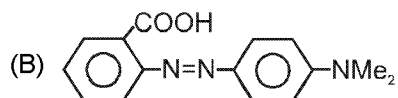
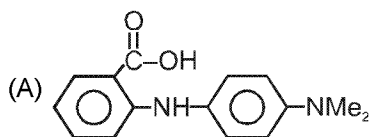
- (A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
- (B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.
- (C) Statement-1 is True, Statement-2 is False.
- (D) Statement-1 is False, Statement-2 is True.

### Comprehension # 1

Methyl red is commonly used as indicator for acid base titrations. It is prepared by treating  $\text{NaNO}_2/\text{HCl}$  with anthranilic acid and the resulting solution is mixed with N,N dimethylaniline and shaken well the solution for some minutes to get "Methyl Red".



24. Which is most likely to be "Methyl Red" ?



25. The two organic materials anthranilic acid and N,N dimethylaniline used in preparation of methyl Red can be best distinguished by :

(A) HCl solution

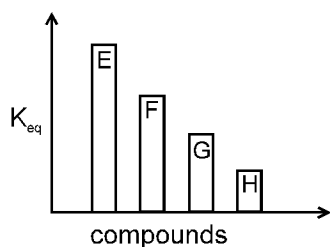
(B) Br<sub>2</sub> water

(C) CHCl<sub>3</sub>/KOH

(D) FeCl<sub>3</sub>

### Comprehension # 2

The relative comparison of equilibrium constants of addition of RMgBr on four carbonyl compounds has been shown by the graph below.



26. Which compound corresponds to H if the four given compounds are :

(A) P - NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>CHO

(B) C<sub>6</sub>H<sub>5</sub>CHO

(C) P - MeOC<sub>6</sub>H<sub>4</sub>CHO

(D) CH<sub>3</sub>COCH<sub>2</sub>CH<sub>3</sub>

27. Which compound corresponds to G if the four given compounds are :

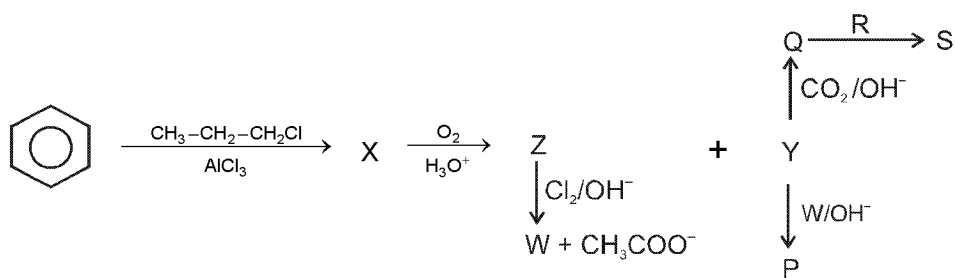
(A) CH<sub>3</sub>CHO

(B) C<sub>6</sub>H<sub>5</sub>COCH<sub>3</sub>

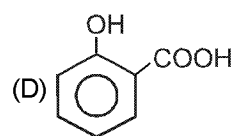
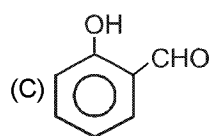
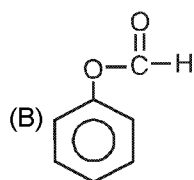
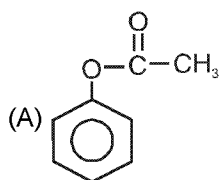
(C) C<sub>6</sub>H<sub>5</sub>CHO

(D) C<sub>6</sub>H<sub>5</sub>COC<sub>6</sub>H<sub>5</sub>

### Comprehension # 3



28. Which of the following compound is 'P' ?

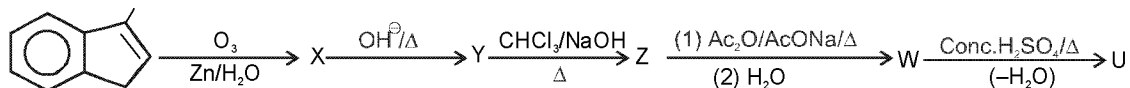


29. S is a well known pain killer which of the following is 'R' ?

- (A)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$       (B)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$       (C)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$       (D)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$

#### Comprehension # 4

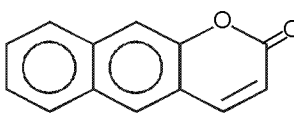
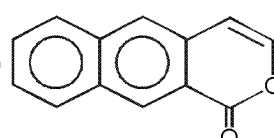
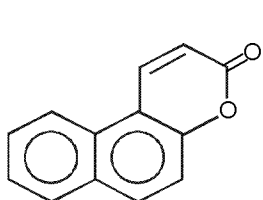
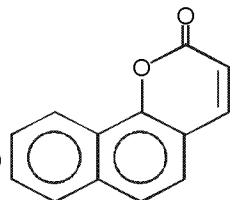
Observe the following sequence of reaction



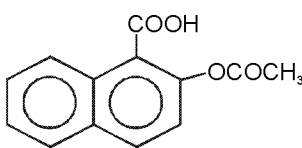
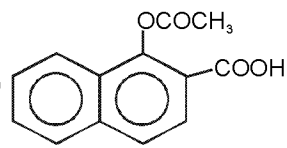
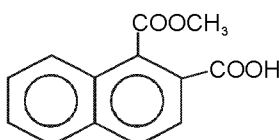
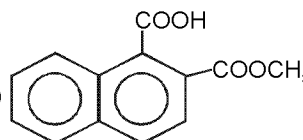
30. The product Y is

- (A)       (B)   
 (C)       (D) 

31. The product U is

- (A)       (B)   
 (C)       (D) 

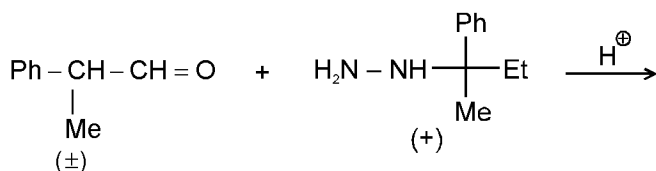
32. Compound (Y) on reaction with  $\text{CO}_2/\text{NaOH}$  followed by  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$  and pyridine produces :

- (A)       (B)   
 (C)       (D) 

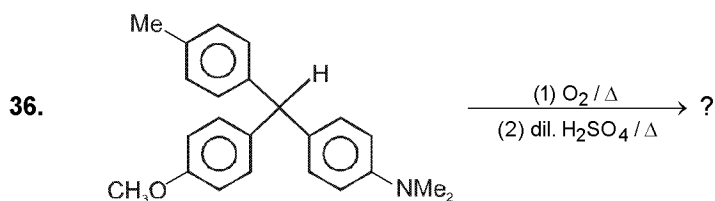
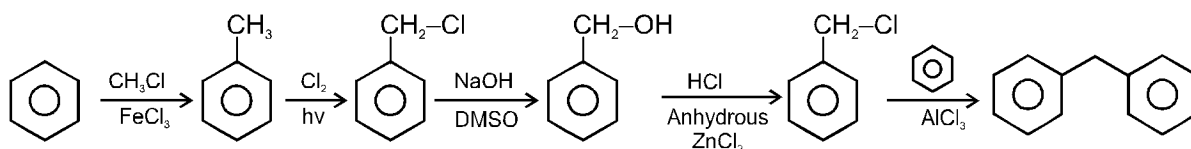
33. Number of positions electrophilic substitution which takes place when salicylic acid is reacted with bromine water ?



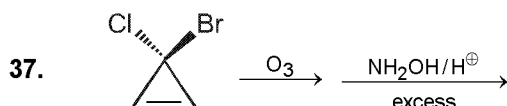
34. The number of stereoisomers of the product obtained in the following reaction is :



35. In the following sequence of reaction number of Nucleophilic substitution is :

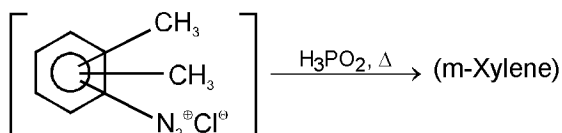


Total number of organic products formed (major, minor all).

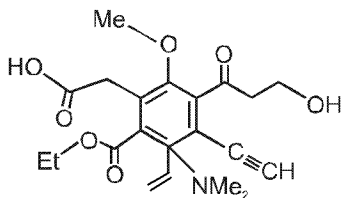


The total number of isomeric products (including stereoisomers) formed at the end of the reaction is :

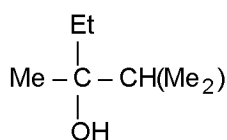
38. How many aromatic diazonium chlorides of xylene can be reduced to meta-xylene by  $\text{H}_3\text{PO}_2$ ?



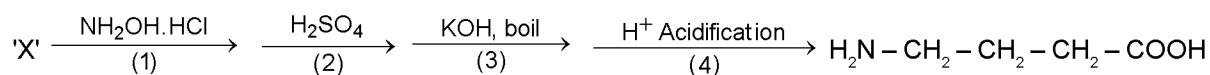
39. Find the total number of groups with which the Grignard Reagent ( $\text{CH}_3\text{MgBr}$ ) can react.



40. How many types of Grignard reagent can be used to prepare the following alcohol, by using different Ketones.



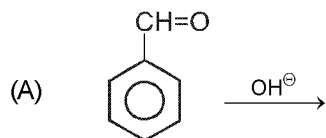
41. Observe the following reaction,



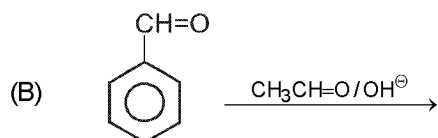
molecular mass of 'X' is :

42. Column-I

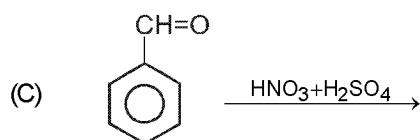
Column-II



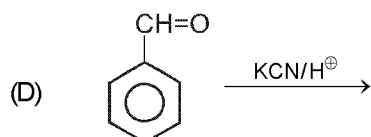
(p) Aromatic ring substitution



(q) Nucleophilic addition



(r) Condensation reaction

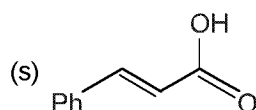
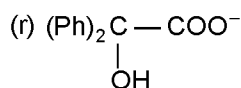
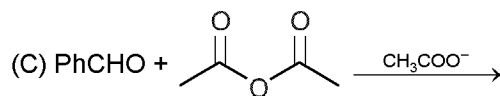
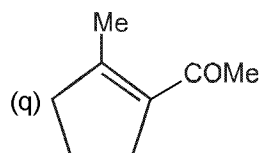
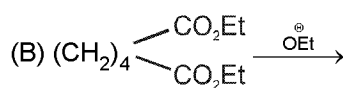
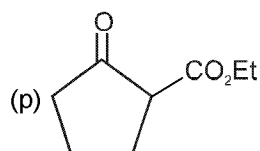
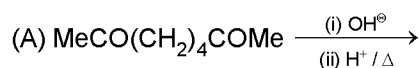


(s) Formation of more than one organic products

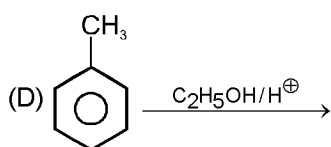
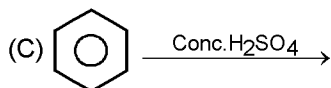
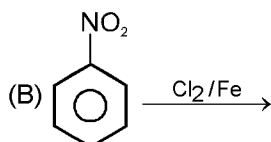
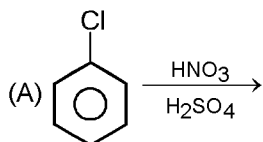
43. Match the column

Column I

Column II



44. **Column-I  
(Reactions)**



**Column-II  
(Features)**

(p)  $K_H/K_D = 1$

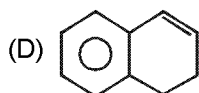
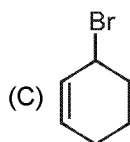
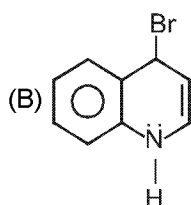
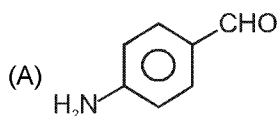
(q)  $K_H/K_D > 1$

(r) Deactivated reactant

(s) Ortho and para substituted products are major

(t) Meta substituted product is major.

45. **Column – I  
(Compounds)**



**Column – II  
(Type of possible reactions)**

(p) Nucleophilic addition

(q) Aliphatic nucleophilic substitution

(r) Elimination

(s) Electrophilic addition reaction

(t) Electrophilic substitution reaction