Additional Problems for Self Practice (APSP)

This Section is not meant for classroom discussion. It is being given to promote self-study and self testing amongst the Resonance students.

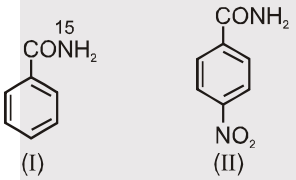
PART - I : PRACTICE TEST-1 (IIT-JEE (MAIN Pattern))

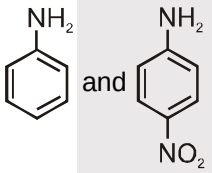
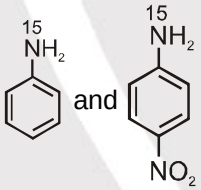
Max. Time : 1 Hr. **Max. Marks : 120**

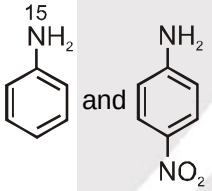
Important Instructions :

1. The test is of **1 hour** duration.
2. The Test Booklet consists of **30** questions. The maximum marks are **120.**
3. Each question is allotted **4 (four)** marks for correct response.
4. Candidates will be awarded marks as stated above in Instructions No. 3 for correct response of each question. **¼ (one fourth)** marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
5. There is only one correct response for each question. Filling up more than one response in any question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instructions 4 above.

1. The products formed when a mixture of the following two amides (I and II) are treated with bromine and aqueous KOH are



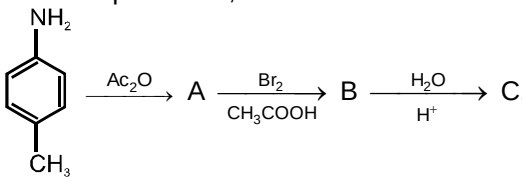
(1)  and (2) 

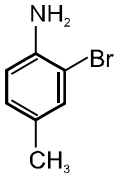
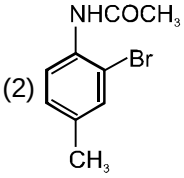
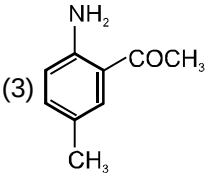
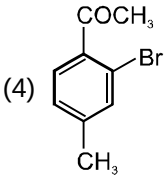
(3)  and (4) a mixture of all of these

2. Which of the following does not give effervescence with $NaHCO_3$?
(1) Phenol (2) p-Nitrophenol (3) 2, 4-dinitrophenol (4) 2, 4,6-trinitrophenol

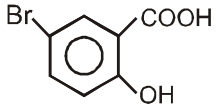
3. The compound which does not give foul smell when heated with $CHCl_3$ & KOH is
(1) m-Toluidine (2) $CH_3–NH_2$ (3) N-Methylaniline (4) $NH_2–CH_2–CH_2–OH$

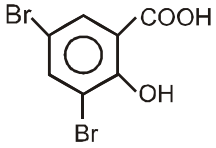
4. The final product C, obtained in this reaction

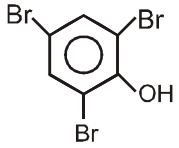


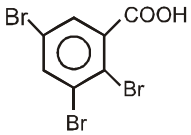
(1)  (2)  (3)  (4) 

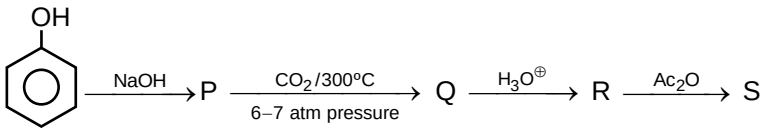
5. The action of bromine water (excess) on salicylic acid results in the formation of :

(1) 

(2) 

(3) 

(4) 

6. 

'S' is :

(1) Aspirin (2) Valine (3) Cumene (4) Salicyclic acid

7. Electrolytic reduction of nitrobenzene in weakly acidic medium gives.

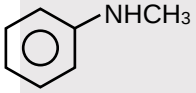
(1) aniline (2) nitrosobenzene

(3) N-phenyl hydroxylamine (4) p-hydroxyaniline

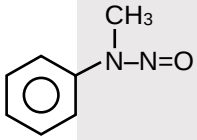
8. In the following reaction, X $\xrightarrow{\text{Bromination}}$ Y $\xrightarrow[\text{HCl}]{NaNO_2}$ Z $\xrightarrow[C_2H_5OH]{\text{Boiling}}$ Tribromobenzene, X is

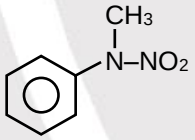
(1) benzoic acid (2) salicylic acid (3) phenol (4) aniline

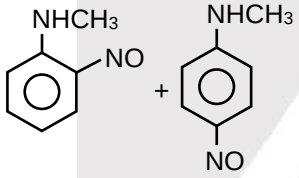
9. Predict the product,

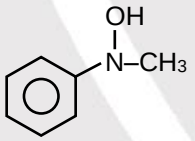


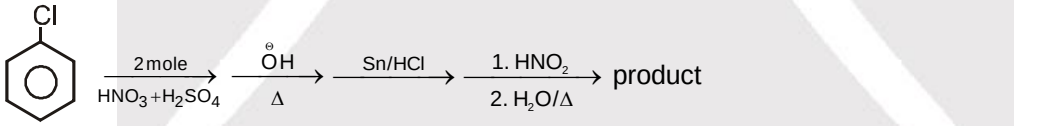
+ $NaNO_2$ + HCl ⟶ Product

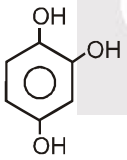
(1) 

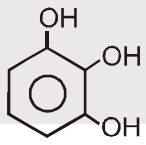
(2) 

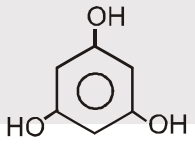
(3) 

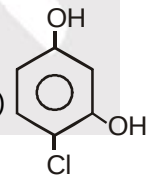
(4) 

10. 

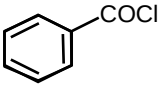
(1) 

(2) 

(3) 

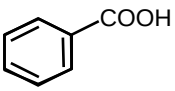
(4) 

11. Reaction by which Benzaldehyde canot be prepared :

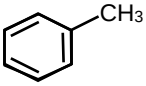
(1) 

+ H_2 in presence of Pd-$BaSO_4$

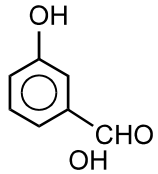
(2) 
+ CO + HCl in presence of anhydrous $AlCl_3$

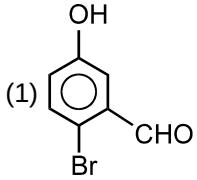
(3) 

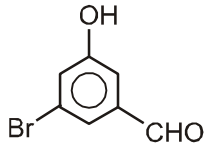
+ Zn/Hg and conc. HCl

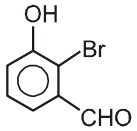
(4) 

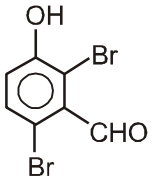
+ CrO_2Cl_2 in CS_2 followed by H_3O^+

12.  $\xrightarrow{Br_2, Fe}$ P (Major)

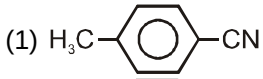
(1) 

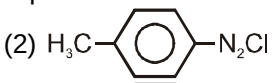
(2) 

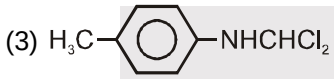
(3) 

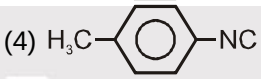
(4) 

13. The reaction of chloroform with alcoholic KOH and p–toluidine form :

(1) 

(2) 

(3) 

(4) 

14. An organic compound P on reduction gives compound Q which on reaction with chloroform and potassium hydroxide forms R. The compound R on catalytic reduction gives N-methylaniline. The compound P is

(1) nitrobenzene (2) nitromethane (3) methylamine (4) aniline

15. Primary amine reacts with carbon disulphide and $HgCl_2$ to produce alkyl isothiocyanate. This reaction is:

(1) Carbylamine reaction (2) Hofmann bromide reaction
(3) Perkin reaction (4) Hofmann mustard oil reaction

16. When aniline reacts with $HNO_2(NaNO_2 + HCl)$ diazonium chloride is formed which on reaction with H_3PO_2 gives :

(1) CH ≡≡ CH (2) C_6H_6 (3) CH_2== CH_2 (4) CH_3–CH_3

17. Aniline reacts with ..... to yield ..... as the final product

(1) Aqueous bromine, 2-bromoaniline (2) Aqueous bromine, 2, 4, 6-tribromoaniline
(3) chloroform/KOH, phenyl cyanide (4) acetyl chloride, benzanilide

18. Which of following statements is/are correct ?

(1) 1°, 2° & 3° amines can be distinguished by Hinsberg reagent.
(2) Phenol does not give Lucas test.
(3) Phenol & alcohols can be distinguished by neutral $FeCl_3$
(4) All of these

19. Which of following statements is/are correct ?

(1) In Reimer-Tiemann reaction, dichlorocarbene intermediate is produced.
(2) Reimer-Tiemann reaction is example of electrophilic substitution reaction.
(3) Highly reactive ring like aniline & highly deactivated ring like nitrobenzene, cyanobenzene do not give Friedel Craft reaction.
(4) All of these

20. Aniline can be obtained by reduction of nitrobenzene with

(1) Fe / HCl (2) Sn / NaOH
(3) Electrolytic reduction under strong acidic conditions (4) All.

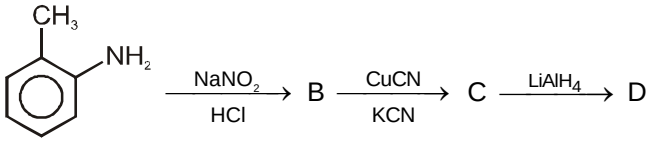
21. Which of the following undergoes mustard oil reaction ?

(1) Primary amines (2) Secondary amines
(3) Tertiary amines (4) All the above

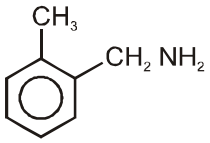
22. $C_2H_5Br \xrightarrow{AgCN} P \xrightarrow{H_3O^+} HCOOH + Q$;
Q is :

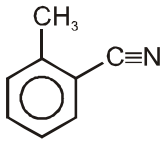
(1) CH_3–CH_2CONH_2 (2) CH_3–CH_2–C≡N (3) CH_3–CH_2–NH_2 (4) CH_3–COOH

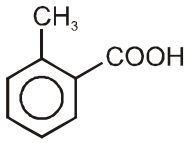
23. In this reaction

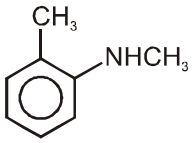


D would be

(1) 

(2) 

(3) 

(4) 

24. $C_6H_5NH_2 + C_6H_5COCl \longrightarrow C_6H_5NHCOC_6H_5 + HCl$. This reaction is called

(1) Schotten Baumann reaction (2) Perkin reaction

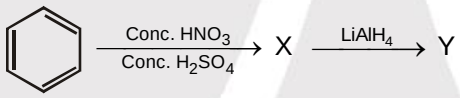
(3) Schmidt reaction (4) Claisen reaction

25. A positive carbylamine test is not given by :

(1) N, N-dimethylaniline (2) 2, 4-Dimethylaniline

(3) 2-Methyl-4-ethylaniline (4) p-Methylbenzyl amine

26. The product 'Y' in the following reaction sequence is :



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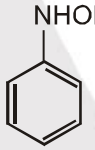
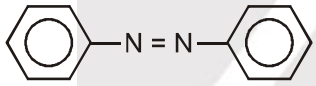
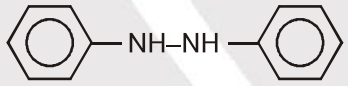
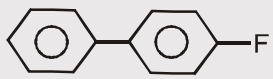
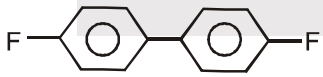
(2) 

(3) 

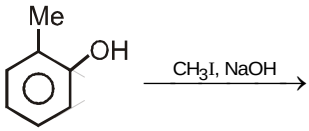
(4) 

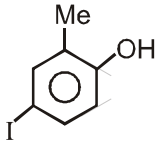
27. $Ph–NH_2 \xrightarrow[0^oC]{HNO_2} A \xrightarrow[BF_3]{HF} B \xrightarrow{\Delta} C$, C is :

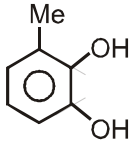
(1) $Ph - N \equiv \overset{\oplus}{N}\ \overset{\ominus}{B}F_4$ (2) 

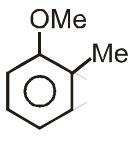
(3) 

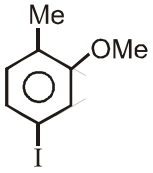
(4) Ph–F

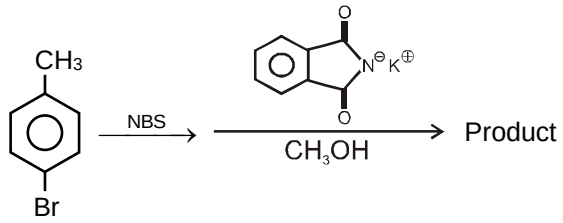
28. 

(1) 

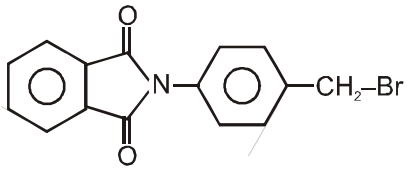
(2) 

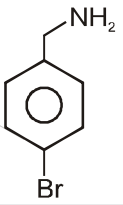
(3) 

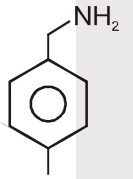
(4) 

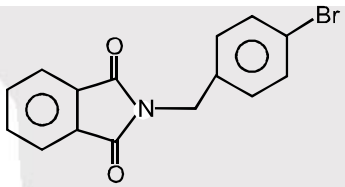
29. 

Structure of product is

(1) 

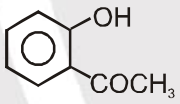
(2) 

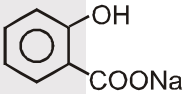
(3) 

(4) 

30. In the following reaction sequence Y is :

$PhOCOCH_3 \xrightarrow[\Delta]{AlCl_3} (X) \xrightarrow[NaOH]{I_2} (Y)$

(1) PhCOONa (2) PhCOOH (3) 

(4) 

Practice Test-1 (IIT-JEE (Main Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

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

PART - II : NATIONAL STANDARD EXAMINATION IN CHEMISTRY (NSEC) STAGE-I

1. Compound A is chiral and has the molecular formula $C_8H_{11}N$. When A reacts with nitrous acid then occurs a brisk evolution of N_2 gas. A dissolves in aqueous HCl. What is the identity of A ? **[NSEC-2000]**
(A) 2-phenylethanamine (B) 1-phenylethanamine
(C) 1-cyclohexylethanamine (D) N-ethylaniline

2. What single isomer would be found in greatest yield when isopropyl chloride undergoes a Friedel-Crafts alkylation with t-butylbenzene ? **[NSEC-2000]**
(A) p-isopropyl-t-butylbenzene (B) m-isopropyl-t-butylbenzene
(C) o-isopropyl-t-butylbenzene (D) none of these

3. The number of π molecular orbitals completely filled in the ground state of benzene is : **[NSEC-2000]**
(A) three (B) one (C) six (D) none

4. An organic compound 'A' having molecular formula C_2H_3N on reduction gave another compound 'B' Upon treatment with nitrous acid, 'B' gave ethyl alcohol on warming with chloroform and alcoholic KOH, it fomed an offensive smelling compound 'C'. The compound 'C' is : **[NSEC-2001]**

(A) $CH_3C{\equiv}N$ (B) $CH_3CH_2N{\equiv}C$ (C) $CH_3CH_2NH_2$ (D) CH_3CH_2OH

5. The compound which reacts with aqueous nitrous acid at low temperature to produce an oily nitrosoamine **[NSEC-2002]**

(A) ammonia (B) methylamine (C) dimethylamine (D) trimethylamine

6. p-Chlorobenzoic acid can be prepared by reacting p-aminobenzoic acid with **[NSEC-2002]**

(A) HCl (B) Cu_2Cl_2

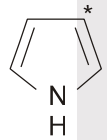
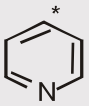
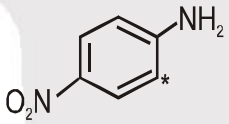
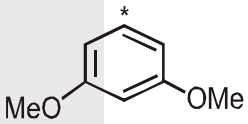
(C) Cl_2 in presence of $AlCl_3$ (D) HNO_2, followed by hot solution of Cu_2Cl_2.

7. n-propylamine containing no secondary and tertiary amines as impurities is prepared by**[NSEC-2002]**

(A) Hoffmann synthesis (B) Gabriel synthesis

(C) reacting n-propylchloride with ammonia (D) none of these

8. The most favourable position (indicated by) for an electrophilic attack is **[NSEC-2003]**

(A)  (B)  (C)  (D) 

9. The compound that on treatment with benzene sulphonyl chloride, forms a precipitate soluble in alkali, is **[NSEC-2003]**

(A) $(C_2H_5)_2NH$ (B) $C_6H_5NHCOCH_2CH_3$

(C) $C_6H_5{-}CH_2{-}NH_2$ (D) $CH_3{-}CONH_2$.

10. The substance that gives a primary amine on hydrolysis is **[NSEC-2004]**

(A) nitroparaffin (B) alkyl cyanide (C) oxime (D) alkyl isocyanide.

11. Toluene o/p orienting with respect to an electrophilic substitution reaction due to **[NSEC-2004]**

(A) +I effect of the methyl group

(B) +I as well as +M effect of the methyl group

(C) hyperconjugation between the methyl group and the phenyl ring

(D) +M effect to the methyl group.

12. The product obtained when 4-hydroxybenzene sulphonic acid is treated with an excess of bromine water is **[NSEC-2004]**

(A) 2-bromo-4-hydroxybenzene sulphonic acid

(B) 2,3-dibromo-4-hydroxybenzene sulphonic acid

(C) 2,6-dibromo-4-hydroxybenzene sulphonic acid

(D) 2,4,6-tribromophenol.

13. The most appropriate reaction for the conversion of bromobenzene to benzoic acid is **[NSEC-2005]**

(A) Reimer-Tiemann reaction (B) Grignard reagent

(C) Claisen rearrangement (D) Friedel-Crafts reaction.

14. p-bromoaniline is prepared from aniline via **[NSEC-2005]**

(A) direct bromination of aniline in presence of Lewis acid

(B) bromination of acetanilide followed by hydrolysis

(C) direct bronination of aniline in presence of light

(D) amination of bromine.

15. Which one of the following has the highest melting point ? **[NSEC-2005]**

(A) Phenol (B) para - Nitrophenol

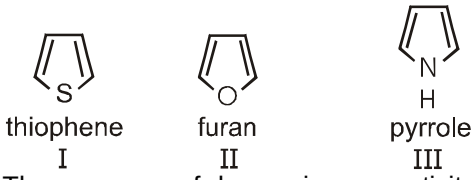
(C) meta - Nitrophenol (D) ortho - Nitrophenol.

16. On bromination, the electron rich phenoxide ion will be attacked most readily **[NSEC-2006]**

(A) on the negatively charged oxygen atom (B) on the ortho and para carbon atoms

(C) on the meta carbon atom (D) on the ortho carbon atom.

17.



thiophene I furan II pyrrole III

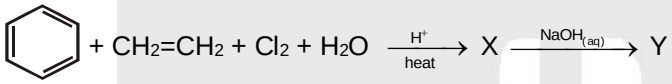
The sequence of decreasing aromaticity in the above compounds is **[NSEC-2006]**

(A) I > II > III (B) I > III > II (C) II > III > I (D) III > II >I.

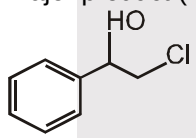
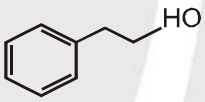
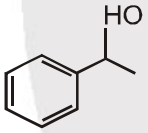
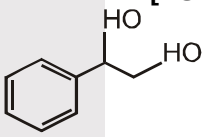
18. Can the amino group, in the aniline molecule, become meta-directing in an electrophilic substitution reaction? **[NSEC-2006]**

(A) No, it never shows meta directing properties.
(B) Yes, in a strongly acidic medium.
(C) Yes, in a strongly alkaline medium.
(D) Yes, in a non-polar solvent.

19. Consider the following reactions



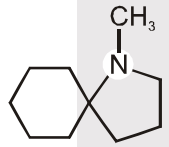
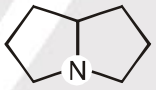
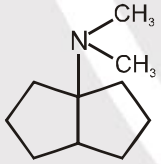
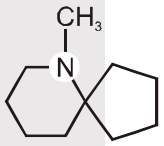
the major product (Y) of the reaction is : **[NSEC-2007]**

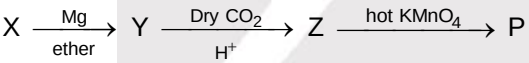
(A)  (B)  (C)  (D) 

20. The prduct of Reimer-Tiemann reaction is a **[NSEC-2008]**

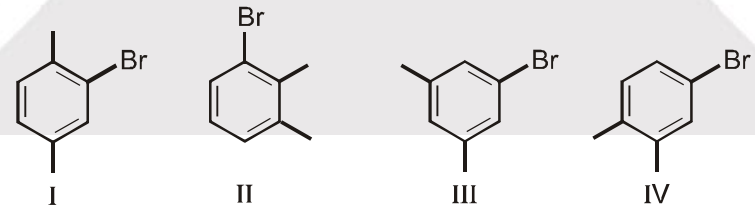
(A) phenolic aldehyde (B) hydroxyamine (C) nitroaldehyde (D) nitroalcohol

21. The nitrogen atom in the following cyclic compounds can be removed as trimethylamine by successive Hoffmann eliminations (involving exhaustive methylation followed by heating with AgOH). The amine which will require a greater number of Hoffmann eliminations is : **[NSEC-2009]**

(A)  (B)  (C)  (D) 

22.  **[NSEC-2009]**

The two isomeric compounds which will give the same tricarboxylic acid after the above sequence of reactions, are :



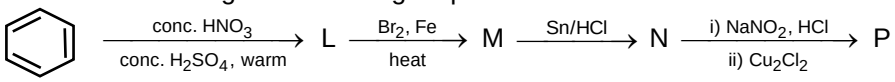
I II III IV

(A) I and II (B) III and IV (C) I and IV (D) II and III

23. Salicylic acid on treatment with bromine water will give **[NSEC-2013]**

(A) 2-bromo-6-hydroxybenzoic acid (B) 2,4,6-tribromophenol
(C) 2,6-dibromobenzoic acid (D) 1,3-dibromo-6-hydroxybenzoic acid

24. The product P obtained through the following sequence of reactions is **[NSEC-2014]**

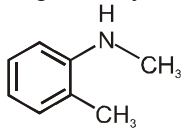
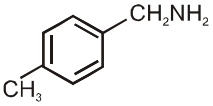
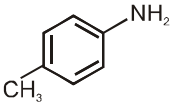
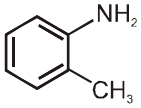


(A) 3-chloroaniline (B) 4- bromochlorobenzene
(C) 3-bromochlorobenzene (D) 3-bromoaniline

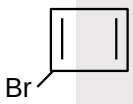
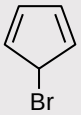
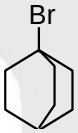
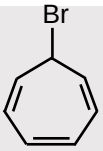
25. Triethylamine is reacted with a peracid to obtain X. The nitrogen atom in X has formal charge **[NSEC-2014]**

(A) 0 (B) +1 (C) –1 (D) +2

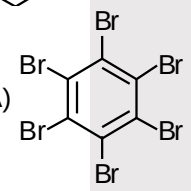
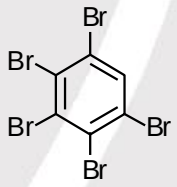
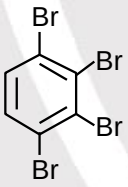
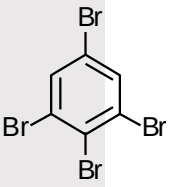
26. An organic base (X) reacts with nitrous acid at 0ºC to give a clear solution. Heating the solution with KCN and cuprous cyanide followed by continued heating with conc. HCl gives a crystalline solid. Heating this solid with alkaline potassium permanganate gives a compound which dehydrates on heating to a crystalline solid. "X" is : **[NSEC-2015]**

(A)  (B)  (C)  (D) 

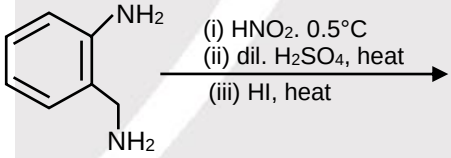
27. Organic compounds sometimes adjust their electronic as well as steric structures to attain stability. Among the following, the compound having highest dipole moment is : **[NSEC-2016]**

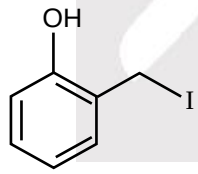
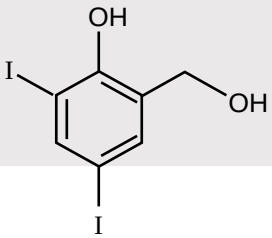
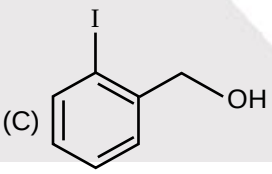
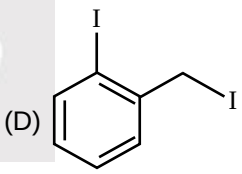
(A)  (B)  (C)  (D) 

28. The major product 'S' of the following reaction sequence is : **[NSEC-2016]**

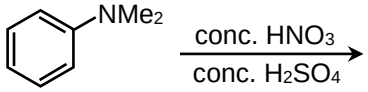
(A)  (B)  (C)  (D) 

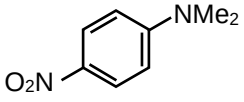
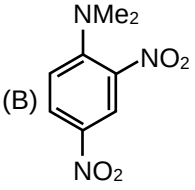
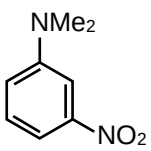
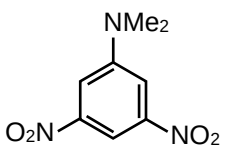
29. The product of the following reaction is **[NSEC-2017]**



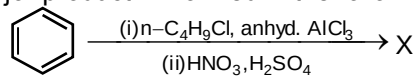
(A)  (B)  (C)  (D) 

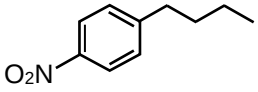
30. The *major* product of the following reaction is **[NSEC-2018]**

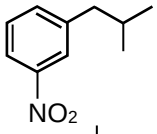


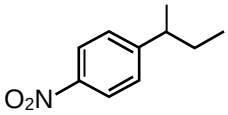
(A)  (B)  (C)  (D) 

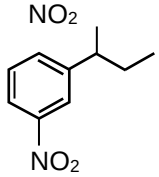
31. The major product 'X' formed in the following reaction is **[NSEC-2018]**



(A) 

(B) 

(C) 

(D) 

PART - III : PRACTICE TEST-2 (IIT-JEE (ADVANCED Pattern))

Max. Time : 1 Hr. **Max. Marks : 60**

Important Instructions

A. General

1. The test is of 1 hour duration.
2. The Test Booklet consists of 21 questions. The maximum marks are 63.

B. Question Paper Format

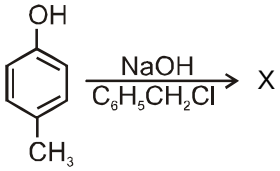
3. Each part consists of five sections.
4. Section-1 contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE is correct.
5. Section-2 contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE OR MORE THAN ONE are correct.
6. Section-3 contains 3 questions. The answer to each of the questions is a single-digit integer, ranging from 0 to 9 (both inclusive).
7. Section-4 contains 2 paragraphs each describing theory, experiment and data etc. 2 questions relate to paragraph. Each question pertaining to a partcular passage should have only one correct answer among the four given choices (A), (B), (C) and (D).

C. Marking Scheme

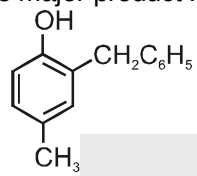
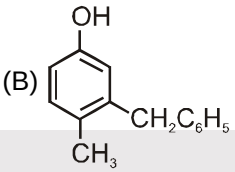
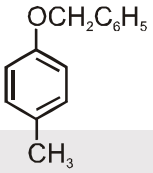
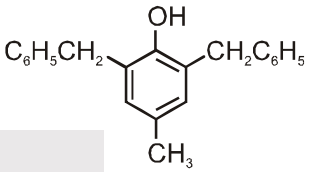
8. For each question in Section 1 and 4 you will be awarded 3 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (– 1) mark will be awarded.
9. For each question in Section-2, you will be awarded 3 marks. If you darken all the bubble(s) corresponding to the correct answer(s) and zero mark. If no bubbles are darkened. No negative marks will be answered for incorrect answer in this section.
10. For each question in Section-3, you will be awarded 3 marks if you darken only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. No negative marks will be awarded for incorrect answer in this section.

SECTION-1 : (Only One option correct Type)

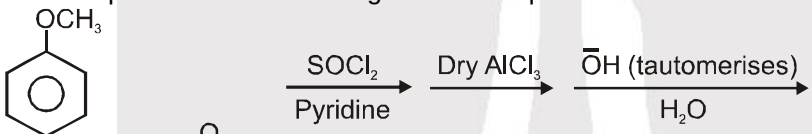
This section contains 7 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which Only ONE option is correct.

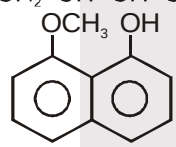
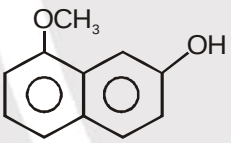
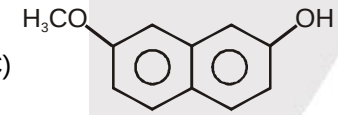
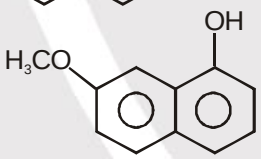
1. 

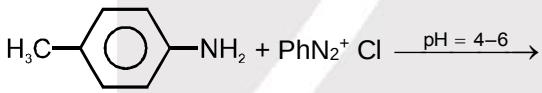
The major product X in the above reaction is

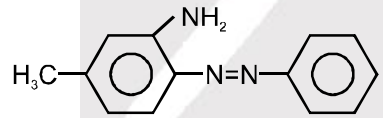
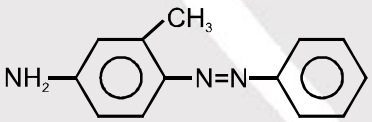
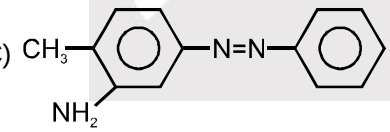
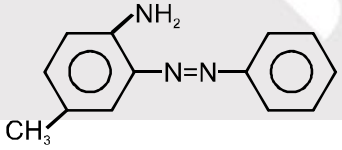
(A) 
(B) 
(C) 
(D) 

2. The end product of the following reaction sequence is



(A) 
(B) 
(C) 
(D) 

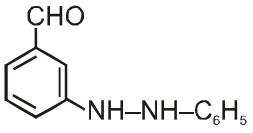
3. 

(A) 
(B) 
(C) 
(D) 

4. $C_6H_5N_2Cl \xrightarrow{SnCl_2/HCl} (A) \xrightarrow{C_6H_5CHO} (B)$

The product (B) in the above sequence of reaction is

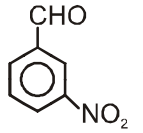
(A) $C_6H_5–N=N–C_6H_5$ (B) $C_6H_5–N=CH–C_6H_5$

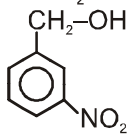
(C) $C_6H_5–NH–N=CH–C_6H_5$ (D) 

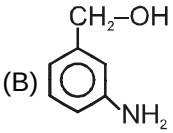
5. $X \xrightarrow{Sn/HCl} Y \xrightarrow[HCl]{NaNO_2} Z \xrightarrow[\Delta]{CuCN} (P) \xrightarrow{H_3O} Ph–COOH$

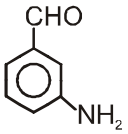
correct options is/are :

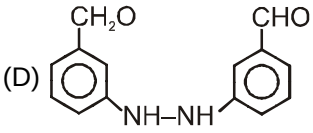
(A) X is $Ph–NH_2$ (B) Y is $Ph–NO_2$ (C) Z is $Ph–NH_2$ (D) P is Ph–CN

6.  $\xrightarrow{SnCl_2+HCl}$ Product is

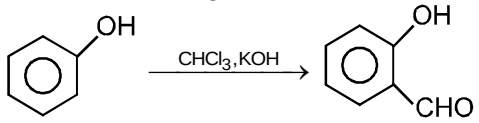
(A) 

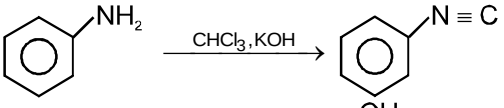
(B) 

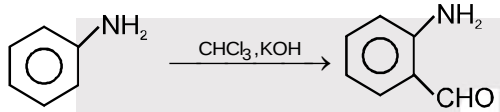
(C) 

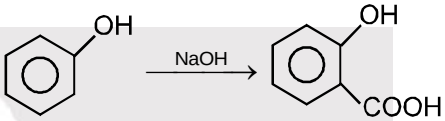
(D) 

7. Which of the following is **incorrect** :

(A) 

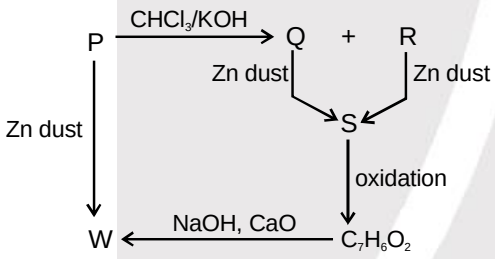
(B) 

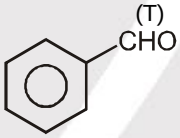
(C) 

(D) 

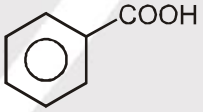
Section-2 : (One or More than one options correct Type)

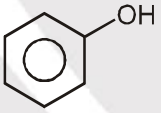
This section contains 7 multipole choice questions. Each questions has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

8. 

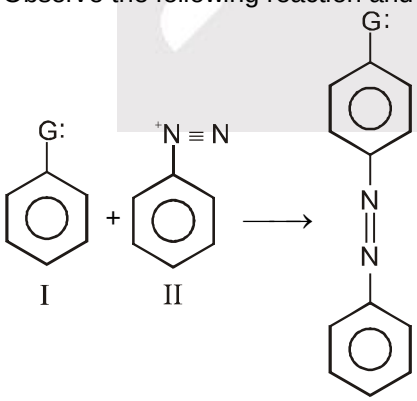
(A) Compound S = 

(B) Compound W = 

(C) Compound T = 

(D) Compound Q = 

9. Observe the following reaction and determine True statement



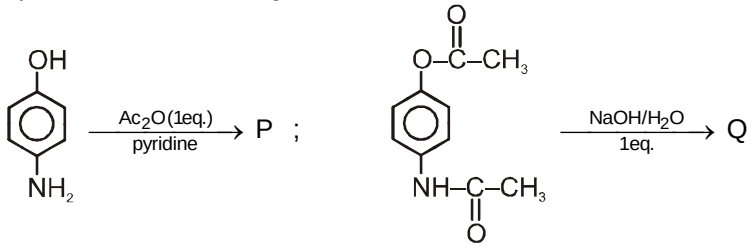
(A) If aromatic ring I have $-NO_2$ group then rate of reaction will decrease.

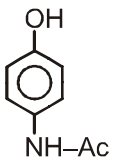
(B) If aromatic ring II have $-NO_2$ group then rate of reaction will increase.

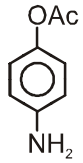
(C) In this reaction Wheland intermediate will form.

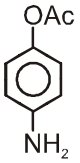
(D) In this reaction Meisenheimer intermediate is formed.

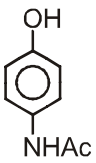
10. Correct options for the following reaction is / are



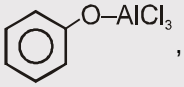
(A) P = 

(B) Q = 

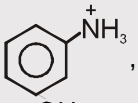
(C) P = 

(D) Q = 

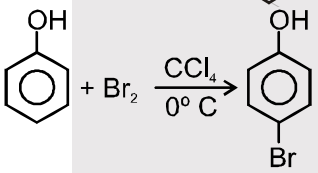
11. Which of the following is correct :

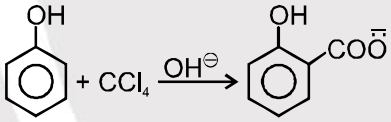
(A) Due to formation of 

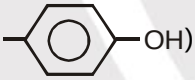
, Ph–OH does not give Friedel Craft acylation reaction (at normal temperature).

(B) Due to formation of 

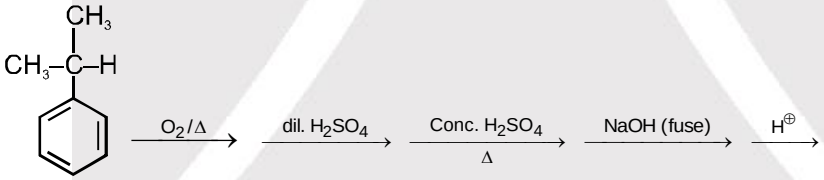
, Ph–NH_2 give m-nitro-aniline, in sufficient amount during nitration.

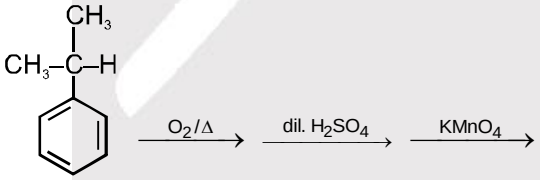
(C) 

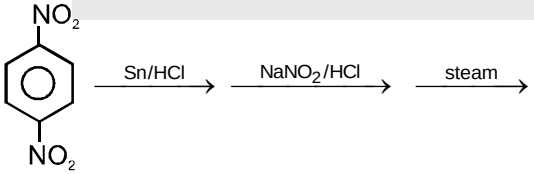
(D) 

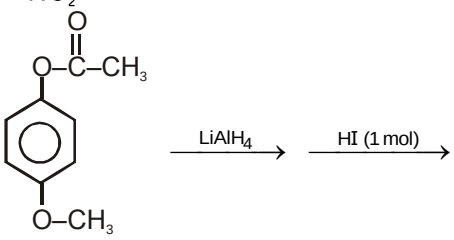
12. Which are the routes that can prepare quinol (

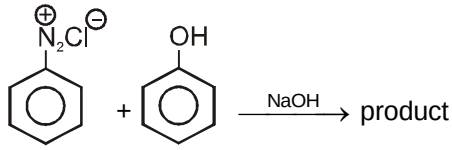
) :

(A) 

(B) 

(C) 

(D) 

13. 

Which of the following statement is **CORRECT** about product ?

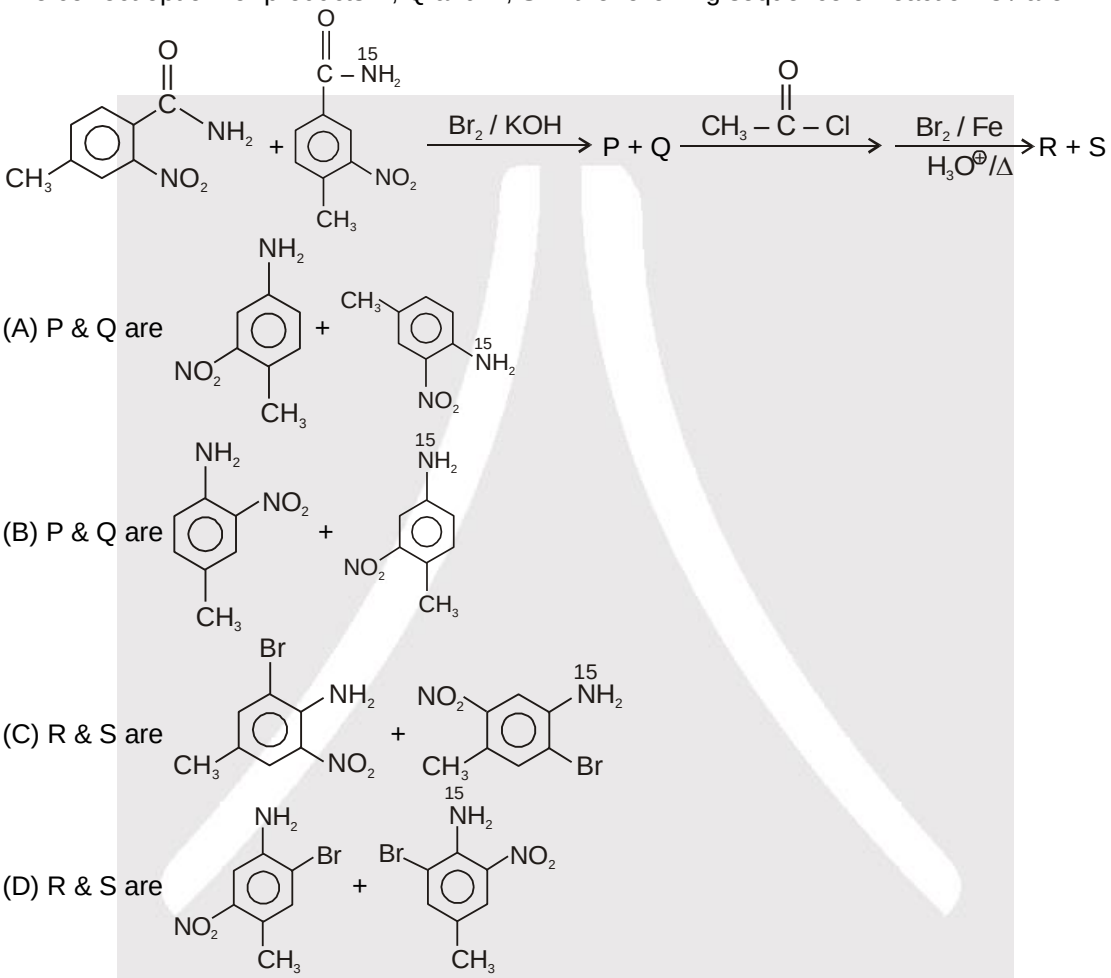
(A) Product shows geometrical isomerism.

(B) Product shows colour due to extended conjugation.

(C) Electrophile attacks at para position due to its large size.

(D) Reaction is electrophilic substitution.

14. The correct option for products P, Q and R, S in the following sequence of reaction is / are :



(A) P & Q are

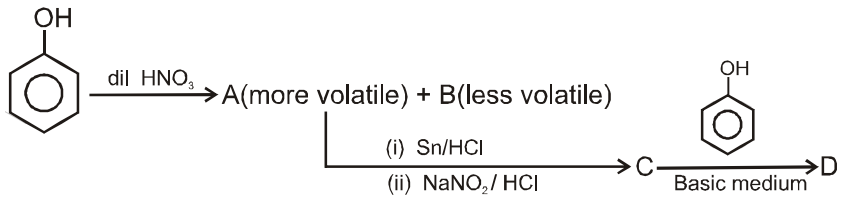
(B) P & Q are

(C) R & S are

(D) R & S are

Section-3 : (One Integer Value Correct Type.)

This section contains 3 questions. Each question, when worked out will result in one integer from 0 to 9 (both inclusive)

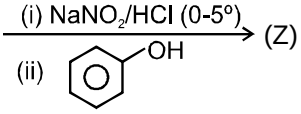
15. 

Double bond equivalent of D is :

16. Consider the following reaction sequence

p-nitrophenol + $C_2H_5Br + NaOH_{aq} \longrightarrow$ (X)

(X) + Sn + HCl $\longrightarrow$ (Y)

(Y) + (ii)  $\xrightarrow{\text{(i) } NaNO_2/HCl\ (0\text{-}5^\circ)}$ (Z)

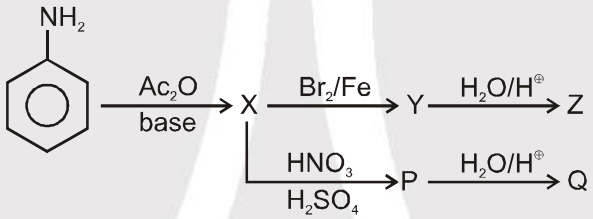
How many carbon atoms are present in Z.

17. A mixture of 1º amides (benzenoid) having molecular formula (C_8H_9NO) reacted with Br_2/NaOH. The number of 1º amines products formed will be :

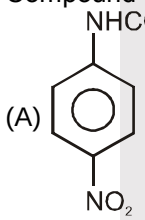
SECTION-4 : Comprehension Type (Only One options correct)

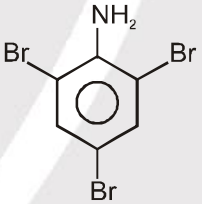
This section contains 2 paragraphs, each describing theory, experiments, data etc. 2 questions relate to the paragraph. Each question has only one correct answer among the four given options (A), (B), (C) and (D)

Paragraph for Questions 18 to 19



18. Compound 'Z' is :

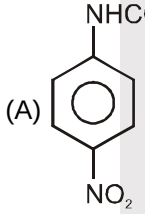
(A) 

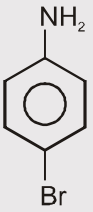
(B) 

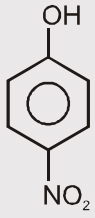
(C) 

(D) 

19. Compound 'Q' is :

(A) 

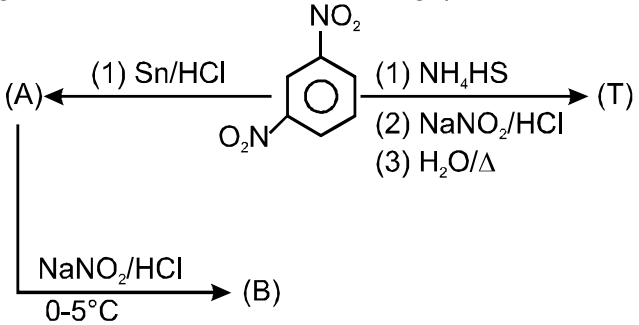
(B) 

(C) 

(D) 

Paragraph for Question Nos. 20 to 21

Observe the following reactions and answer the following questions.



20. For Product (T), The correct statement is :
(A) Turns Red litmus blue
(B) Turns $FeCl_3$ (Neutral) into coloured solution
(C) Gives Friedel-Craft-Alkylations reaction
(D) Contains two 'N' atoms

21. The product B on heating with H_2O produces :
(A) m-cresol (B) Resorcinol (C) Salicylic acid (D) Salicylaldehyde

Practice Test-2 ((IIT-JEE (ADVANCED Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

Que.	1	2	3	4	5	6	7	8	9	10
Ans.										
Que.	11	12	13	14	15	16	17	18	19	20
Ans.										
Que.	21									
Ans.										

APSP Answers

PART - I

1.	(3)	**2.**	(1)	**3.**	(3)	**4.**	(1)	**5.**	(3)
6.	(1)	**7.**	(1)	**8.**	(4)	**9.**	(1)	**10.**	(1)
11.	(3)	**12.**	(1)	**13.**	(4)	**14.**	(1)	**15.**	(4)
16.	(2)	**17.**	(2)	**18.**	(4)	**19.**	(4)	**20.**	(1)
21.	(1)	**22.**	(3)	**23.**	(1)	**24.**	(1)	**25.**	(1)
26.	(3)	**27.**	(4)	**28.**	(3)	**29.**	(4)	**30.**	(4)

PART - II

1.	(B)	**2.**	(A)	**3.**	(A)	**4.**	(B)	**5.**	(C)
6.	(D)	**7.**	(B)	**8.**	(C)	**9.**	(C)	**10.**	(D)
11.	(C)	**12.**	(D)	**13.**	(B)	**14.**	(B)	**15.**	(B)
16.	(B)	**17.**	(B)	**18.**	(B)	**19.**	(C)	**20.**	(A)
21.	(B)	**22.**	(C)	**23.**	(B)	**24.**	(C)	**25.**	(B)
26.	(D)	**27.**	(D)	**28.**	(B)	**29.**	(A)	**30.**	(C)
31.	(C)								

PART - III

1.	(C)	**2.**	(D)	**3.**	(D)	**4.**	(C)	**5.**	(D)
6.	(C)	**7.**	(C)	**8.**	(ABC)	**9.**	(ABC)	**10.**	(AD)
11.	(ABCD)	**12.**	(ACD)	**13.**	(ABCD)	**14.**	(BC)	**15.**	D.U. = 9
16.	14	**17.**	04	**18.**	(D)	**19.**	(D)	**20.**	(B)
21.	(B)								

APSP Solutions

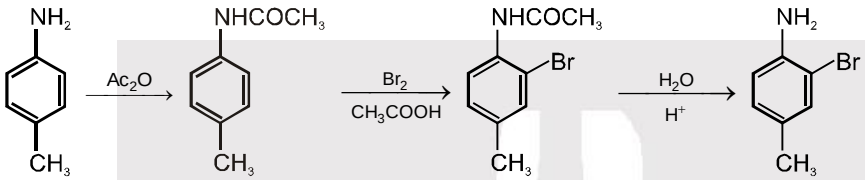
PART - I

1. It is Hofmann bromamide reaction. Hofmann bromamide reaction involves an intramolecular rearrangement. So no cross products are formed even if we mix together two different amides in the reaction.

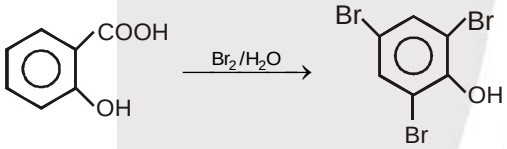
2. $NaHCO_3$ does not give effervescence with phenol. But ortho-para nitro phenols give effervescence with $NaHCO_3$.

3. Only 1º amine give carbyl amine test.

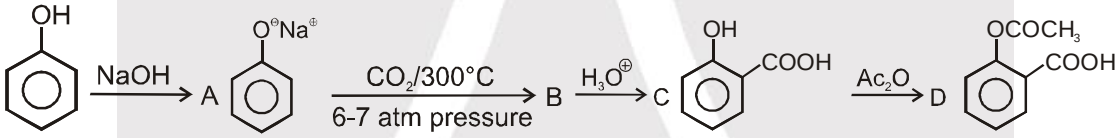
4.



5.

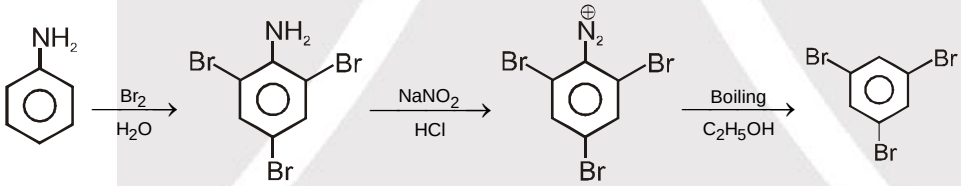


6.

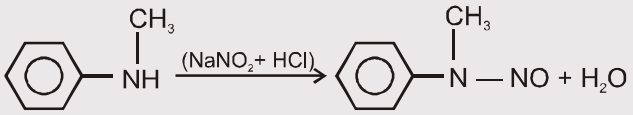


7. It is fact.

8.

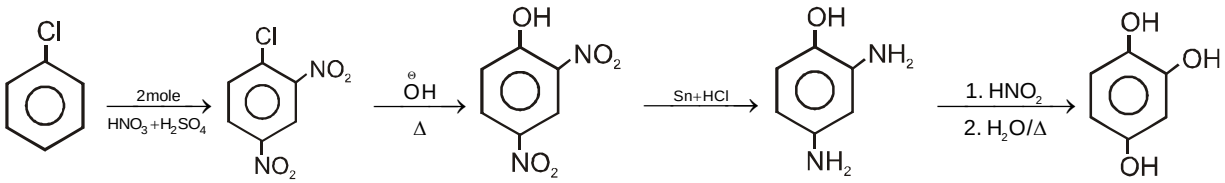


9. **Secondary aliphatic and aromatic amines** react with nitrous acid to produce nitroso-amines that are insoluble in the aqueous solution and separate out as a yellow oily layer.



N-Methylaniline N–Nitroso–N–methylaniline

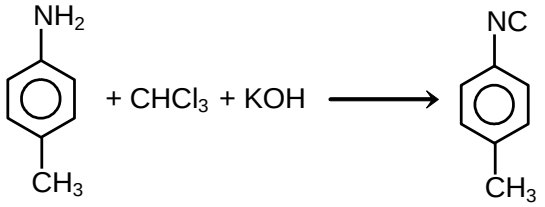
10.



11. In (3) option the given reaction will not yield benzaldehyde.

12. Orientation decided by more activating –OH group [+M effect].

13. It is carbylamine reaction.

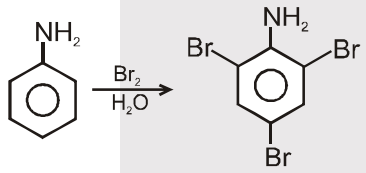


14. $Ph–NO_2 \xrightarrow{\text{Reduction}} Ph–NH_2 + CHCl_3 + KOH \longrightarrow Ph–NC \xrightarrow{\text{Reduction}} Ph–NH–CH_3$
(P) (Q) (R)

15. It is fact.

16. $PhN^{\oplus}{}_2Cl \xrightarrow{H_3PO_2,\Delta} C_6H_6$

17.



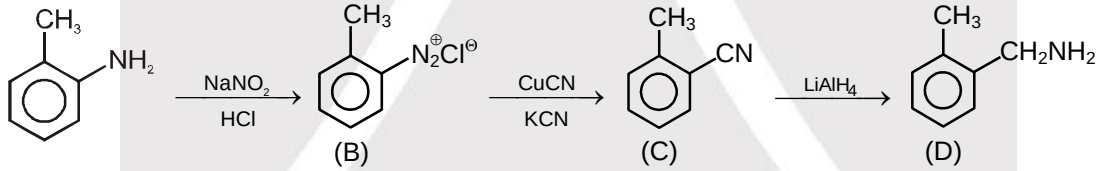
18. Lucas test is given by alcohols. Neutral $FeCl_3$ test is given by phenols.

20. Nitrobenzene reduced into aniline by metal/acid and electrolytic reduction in weakly acidic medium.

21. Mustard oil reaction given by 1° amines because it has 2 active -H atoms.

22. $CH_3CH_2Br \xrightarrow{AgCN} \underset{(P)}{CH_3–CH_2–NC} \xrightarrow{H_3O^+} \underset{(Q)}{CH_3–CH_2–NH_2}$

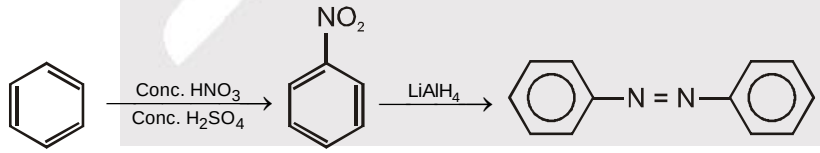
23.



24. This reaction in known as Schotten Baumann reaction.

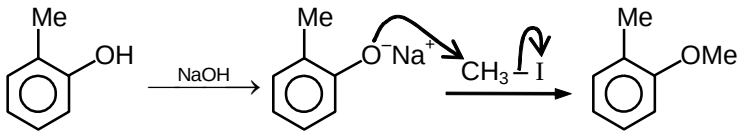
25. 2º & 3º amine does not give carbyl amine test.

26.

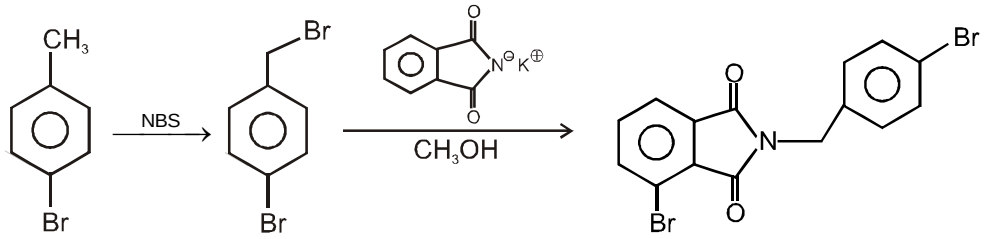


27. $Ph–NH_2 \xrightarrow[0^oC]{HNO_2} PhN_2Cl \xrightarrow[BF_3/\Delta]{HF} Ph–F$

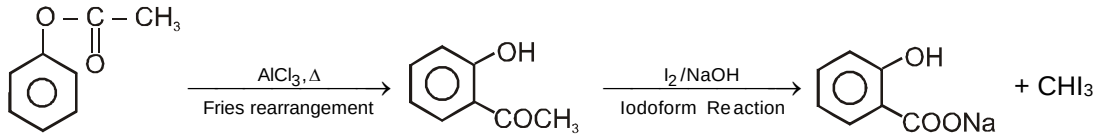
28.



29.

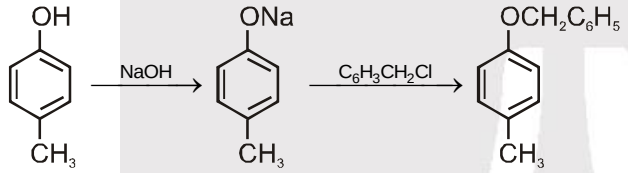


30.

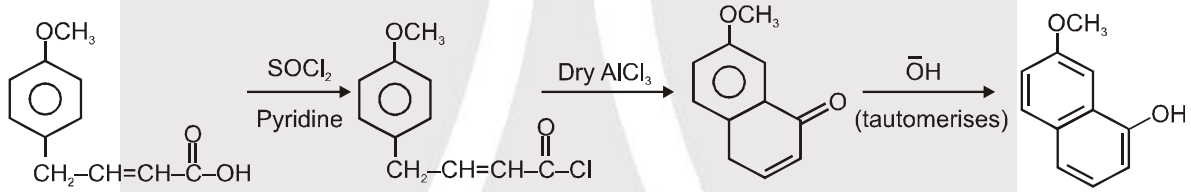


PART - III

1.



2.



3.

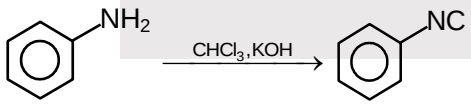
4. Reduction of benzene diazonium chloride with $SnCl_2$ and HCl gives phenyl hydrazine which reacts with benzaldehyde to form phenyl hydrazone.

$$C_6H_5N_2Cl \xrightarrow{SnCl_2/HCl} C_6H_5{-}NH{-}NH_2 \xrightarrow{C_6H_5CHO} C_6H_5{-}NH{-}N{=}CH{-}C_6H_5$$

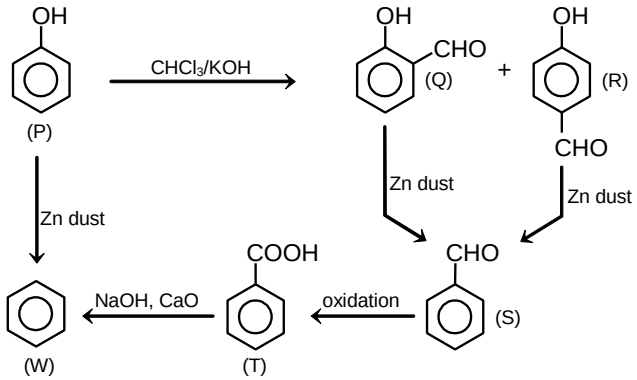
5. $$Ph{-}NO_2 \xrightarrow{Sn/HCl} Ph{-}NH_2 \xrightarrow[HCl]{NaNO_2} PhN_2^+Cl^- \xrightarrow[\Delta]{CuCN} Ph{-}CN \xrightarrow{H_3O} Ph{-}COOH$$

6. $R{-}NO_2$ is reduced by $SnCl_2$ + HCl to $R{-}NH_2$.

7.

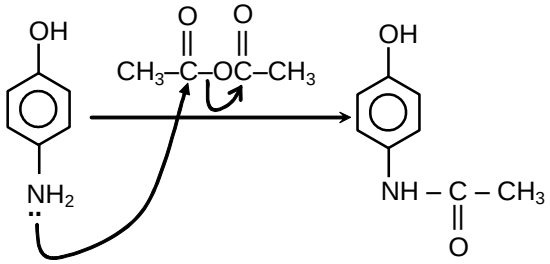


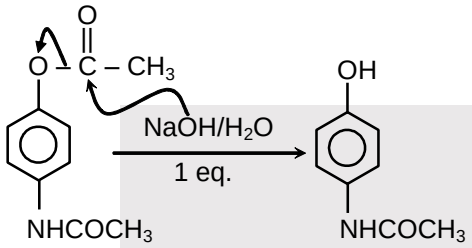
8.



9. It is coupling reaction.

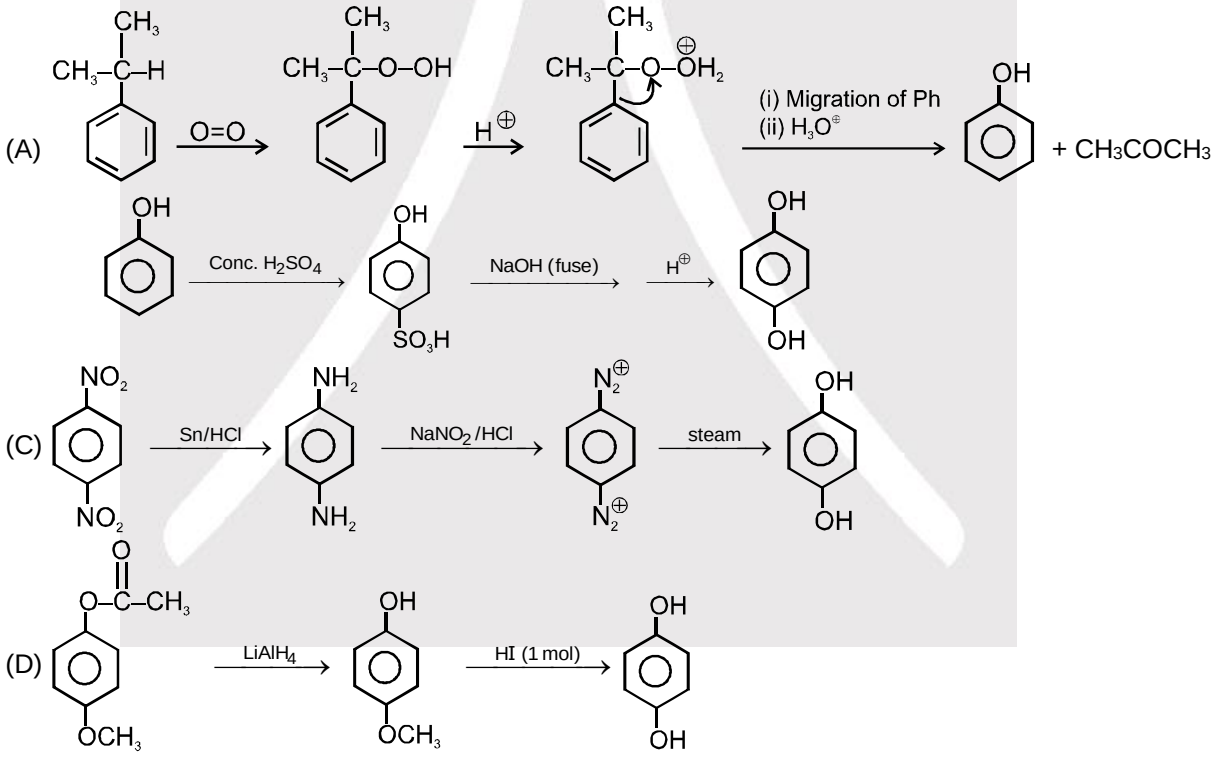
10.



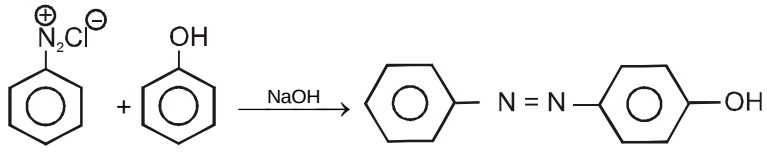


11. (D) is Reimer Tiemann carboxylation reaction.

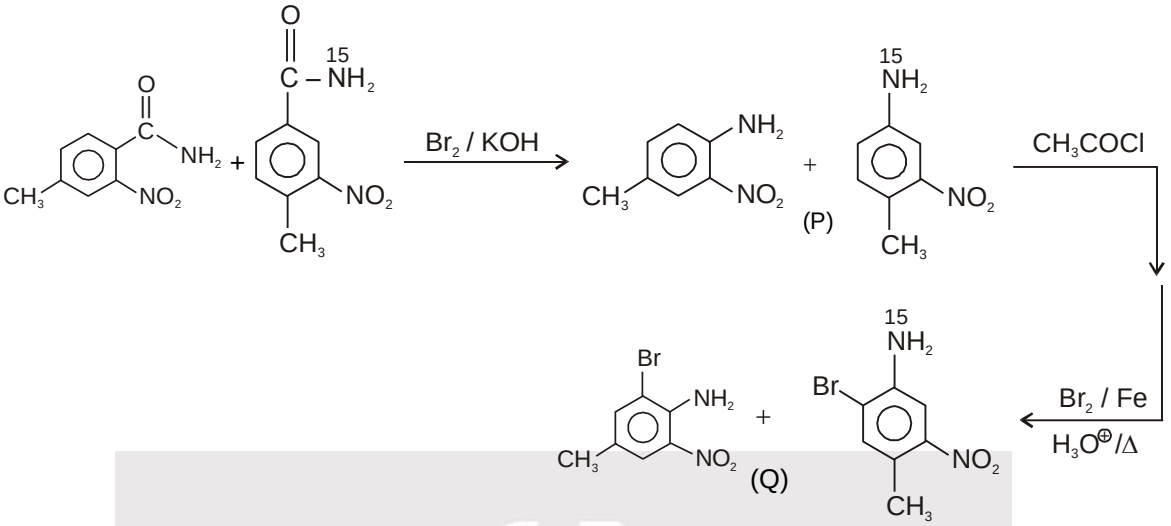
12.



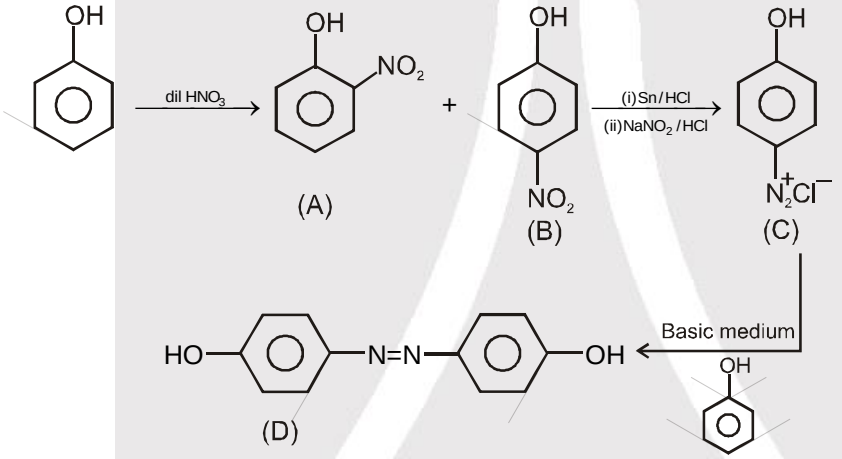
13.



14.



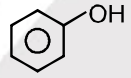
15.



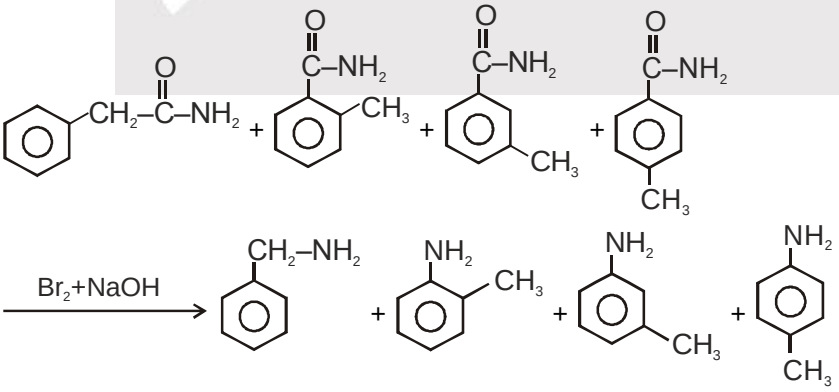
Double bond equivalent of D is 9.

16. *p*-nitrophenol + $C_2H_5Br + NaOH_{aq} \longrightarrow C_8H_9O_3N$ (X)

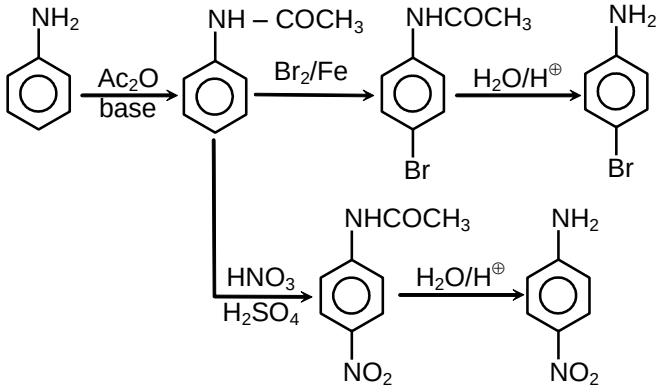
$C_8H_9O_3N$ (X) + Sn + HCl $\longrightarrow$ $C_8H_{11}ON$ (Y)

$C_8H_{11}ON$ (Y) $\xrightarrow[\text{(ii)}]{\text{(i) } NaNO_2/HCl \text{ (0-5°)}}$  $\longrightarrow C_{14}H_{14}O_2N_2$ (Z)

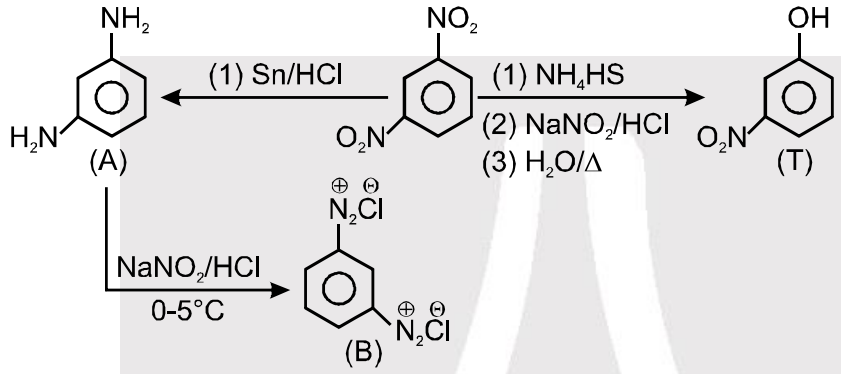
17.



19.


NH2
Ac2O
base
NH – COCH3
Br2/Fe
NHCOCH3
Br
H2O/H⊕
NH2
Br
HNO3
H2SO4
NHCOCH3
NO2
H2O/H⊕
NH2
NO2

(20-21)


NH2
H2N
(A)
(1) Sn/HCl
NO2
O2N
(1) NH4HS
(2) NaNO2/HCl
(3) H2O/Δ
OH
O2N
(T)
NaNO2/HCl
0-5°C
N2Cl
N2Cl
(B)