**1.** A positive carbylamine test is given by :
(1) N, N-dimethylaniline
(2) Acetanilide
(3) N-methyl-o-methylaniline
(4) p-methylbenzylamine

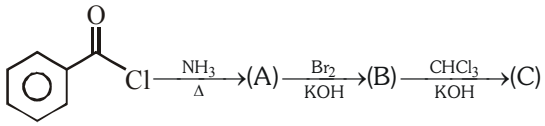
**2.** An aliphatic organic compound Containing C, H and N reacts with dilute HCl to produce formic acid. It is reduced to dimethylamine by Pt or Ni, The compound can be :
(1) $CH_3NC$
(2) $CH_3CN$
(3) $CH_3NH_2$
(4) A mixture of $CH_3$–NC and $CH_3CN$

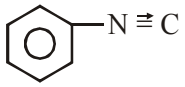
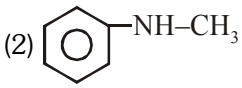
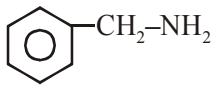
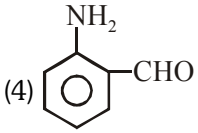
**3.** Which of the following reactions does not yield an amine ?
(1) $R–X + NH_3 \longrightarrow$
(2) $R–CH=NOH + [H] \xrightarrow{Na/C_2H_5OH}$
(3) $R–CN + H_2O \xrightarrow{H^+}$
(4) $R–CONH_2 \xrightarrow{LiAlH_4}$

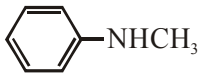
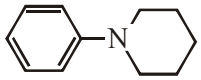
**4.** A compound undergoes the following sequence of reactions :

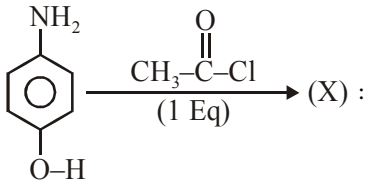
$$C_3H_5N \xrightarrow{\text{Hydrolysis}} \underset{(A)}{C_3H_6O_2} \xrightarrow{Cl_2/P} \underset{(B)}{C_3H_5O_2Cl} \xrightarrow{NH_3} \underset{(C)}{C_3H_7NO_2} :$$

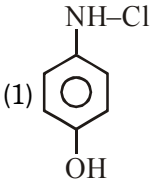
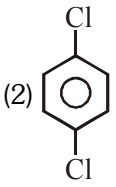
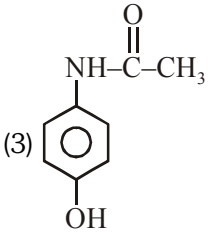
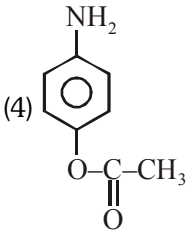
The compound C is :
(1) 1-Nitropropane
(2) 2-Nitropropane
(3) 2-Aminopropanoic acid
(4) 2-Hydroxypropanamide

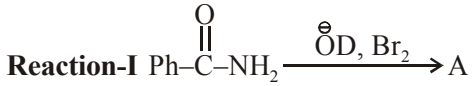
**5.** 

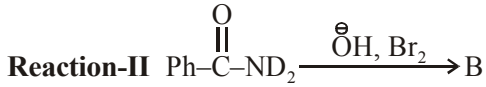
Product (C) is -
(1) 
(2) 
(3) 
(4) 

**6.** Which compound yields a N-nitroso amine after treatment with nitrous acid ?
(1) 
(2) 
(3) 
(4) 

**7.** 

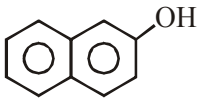
X is -
(1) 
(2) 
(3) 
(4) 

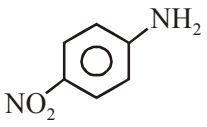
**8.** **Reaction-I** 

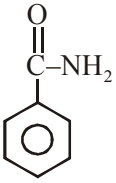
**Reaction-II** 

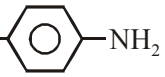
Products A and B are :
(1) Ph–$NH_2$ and Ph–$ND_2$
(2) Ph–$ND_2$ and Ph–$NH_2$
(3) Both PH–$NH_2$
(4) Both Ph–$ND_2$

**9.** Compound X reacts with $NaNO_2$ & $H_2SO_4$ & then reacts with ortho cresol to form sharp colour compound, Compound X may be :

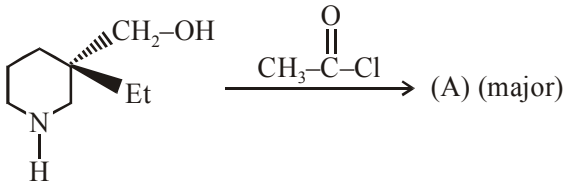
(a) 

(b) 

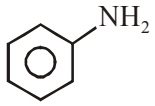
(c) 

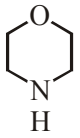
(d) 

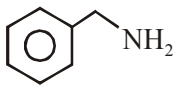
(1) a and b (2) a, b and c
(3) c only (4) b and d

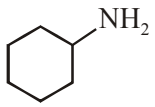
**10.** 

**11.** Which of the following compounds will not form a Schiff base on reaction with p-nitrobenzaldehyde ?

(1) 

(2) 

(3) 

(4) 

**12.** Which of the following compounds on treatment with benzene sulphonly chloride forms an alkali-soluble precipitate ?

(1) $(C_2H_5)_2NH$

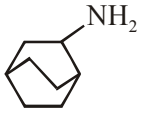
(2) $C_6H_5NHCOCH_2CH_3$

(3) $C_6H_5CH_2NH_2$

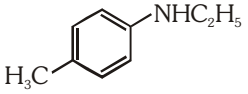
(4) $CH_3CONH_2$

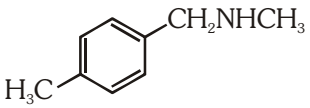
**13.** The amine which cannot prepared by Gabriel phthalimide synthesis method is :

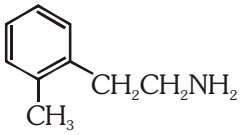
(1) Ph–$NH_2$ (2) Me – $NH_2$

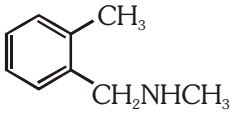
(3) i – pr – $NH_2$ (4) 

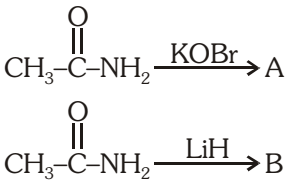
**14.** Compound A has the formula $C_9H_{13}N$ and forms terephthalic acid with $KMnO_4/OH^-$. It forms a compound (in liquid state) with $(COOC_2H_5)_2$ which gets decomposed by KOH. The possible structure of compound A is :

(1) 

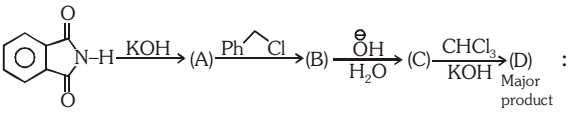
(2) 

(3) 

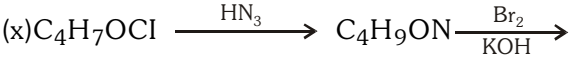
(4) 

**15.** 

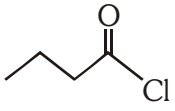
Relation between A and B is
(1) Chain isomer (2) Homologues
(3) Functional isomer (4) Identical

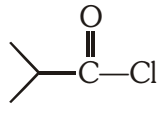
**16.** 

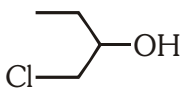
Structure of (D) is :
(1) Ph–$CH_2NH_2$ (2) Ph–NC
(3) $PhCH_2NC$ (4) $PhCH_2CN$

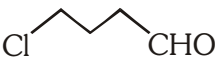
**17.** 

$CH_3–CH_2–CH_2–NH_2$
Compound x is :

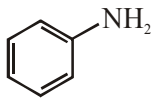
(1) 

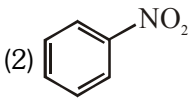
(2) 

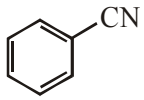
(3) 

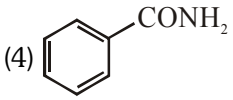
(4) 

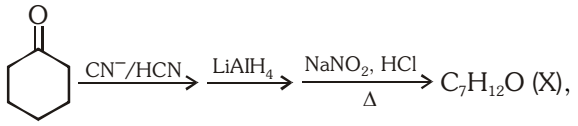
**18.** A given nitrogen-containing aromatic compound A reacts with Sn/HCl, followed by $HNO_2$ to give an unstable compound B. B, on treatment with phenol, forms a beautiful coloured compound C with the molecular formula $C_{12}H_{10}N_2O$. The structure of compound A is :

(1) 

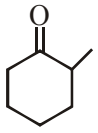
(2) 

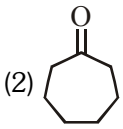
(3) 

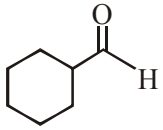
(4) 

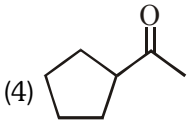
**19.** 

(X) is :

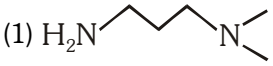
(1) 

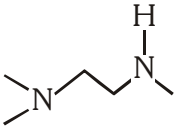
(2) 

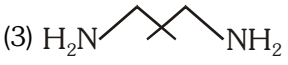
(3) 

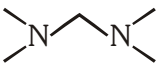
(4) 

**20.** The Hinsberg test of a $C_5H_{14}N_2$ compound produces a solid that is insoluble in 10% aq. NaOH. This solid derivative dissolves in 10% aq. $H_2SO_4$. Which of the following would best fit these facts ?

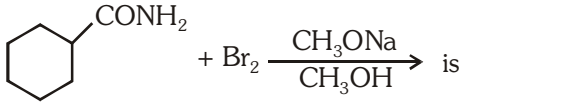
(1) 

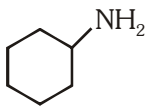
(2) 

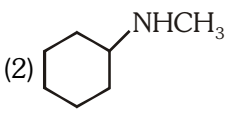
(3) 

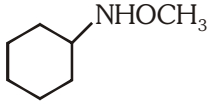
(4) 

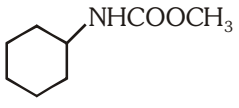
**21.** The product formed in the reaction



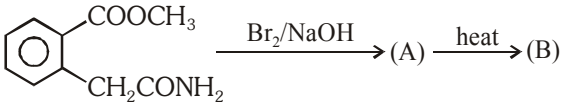
(1) 

(2) 

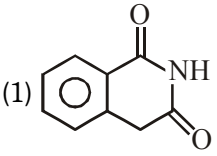
(3) 

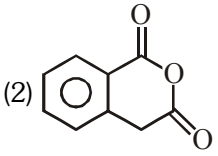
(4) 

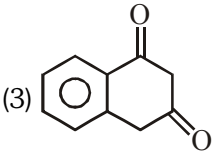
**22.** The following reactions are carried out.

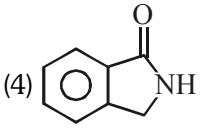


The product (B) is

(1) 

(2) 

(3) 

(4) 

**23.** Choose the wrong statement

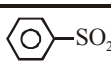
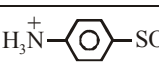
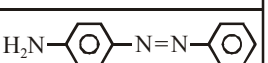
(1) 1° Amine gives mustard oil–reaction

(2) 1° Amine forms salt with $H_2PtCl_6$

(3) 1° Amine gives hydrogen gas with sodium

(4) 1° Amine gives alcohol by hydrolysis

**24.** Match the reagents given in Column-I to the structures given in Column-II

| Column-I | | Column-II | |
|---|---|---|---|
| (a) | Zwitter ion structure | (p) |  |
| (b) | Schiff's base | (q) | $C_6H_5N(CH_3)NO$ |
| (c) | Hinsberg's Reagent | (r) |  |
| (d) | Nitroso amine | (s) |  |
| (e) | Azodye | (t) | R–CH=NR |

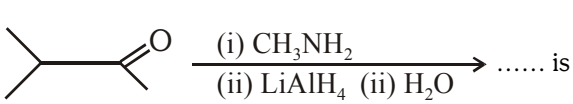
(1) a→r; b→t; c→p; d→q; e→s

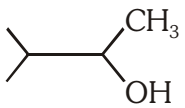
(2) a→r; b→t; c→q; d→s; e→p

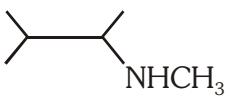
(3) a→q; b→s; c→p; d→r; e→t

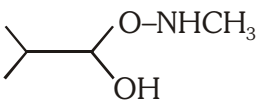
(4) a→t; b→p; c→s; d→q; e→r

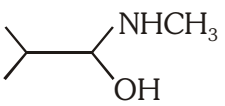
**25.** The major organic product formed from the following reaction :



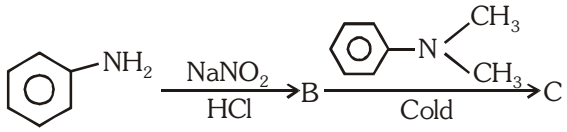
(1) 

(2) 

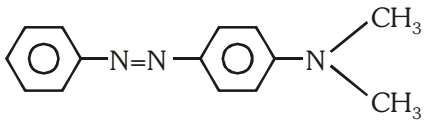
(3) 

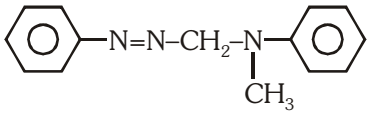
(4) 

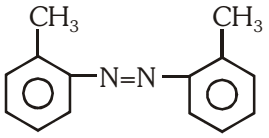
**26.** In a reaction of aniline a coloured product C was obtained.

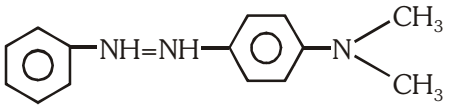


The structure of C would be

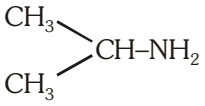
(1) 

(2) 

(3) 

(4) 

**27.** An organic compound ($C_3H_9N$) (A), when treated with nitrous acid gave an alcohol and $N_2$ gas was evolved. (A) on warming with $CHCl_3$ and caustic potash gave (C) which on reduction gave isopropylmethyamine. Predict the structure of (A) :

(1) $CH_3CH_2CH_2–NH_2$ (2) 

(3) $CH_3CH_2–NH–CH_3$ (4) 

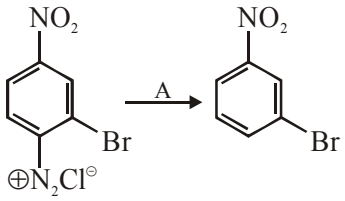
**28.** Method by which aniline cannot be prepared is :

(1) Reduction of nitrobenzene with $H_2$/Pd in ethanol

(2) Potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with NaOH solution

(3) Hydrolysis of phenylisocyanide with acidic solution

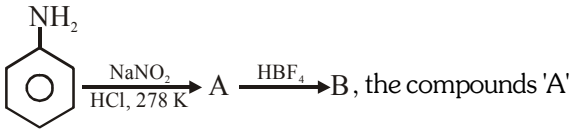
(4) Degradation of benzamide with bromine in alkaline solution

**29.** In the reaction  A is :

(1) $H^+/H_2O$ (2) $HgSO_4/H_2SO_4$

(3) $Cu_2Cl_2$ (4) $H_3PO_2$ and $H_2O$

**30.** In the chemical reactions,



and 'B' respectively are :-

(1) Nitrobenzene and chlorobenzene

(2) Nitrobenzene and fluorobenzene

(3) Phenol and benzene

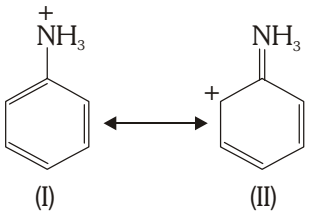
(4) Benzene diazonium chloride and fluorobenzene

**ANSWER KEY** Exercise-I

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

## PREVIOUS YEARS' QUESTIONS EXERCISE-II

**1.** Examine the following two structures for the anilinium ion and choose the correct statement from the ones given below **[IIT-93]**




(1) II is not an acceptable canonical structure because carbonium ions are less stable than ammonium ions

(2) II is not an acceptable canonical structure because it is non-aromatic

(3) II is not an acceptable canonical structure because the nitrogen has ten valence electrons

(4) Both (1) & (3)

**2.** Benzenediazonium chloride on reaction with phenol in wealky basic medium gives **[IIT-98]**

(1) Diphenyl ether

(2) p–Hydroxyazobenzene

(3) Chlorobenzene

(4) Benzene

**3.** Among the following compounds , which will react with acetone to give a product containing >C=N–? **[IIT-98]**

(1) $C_6H_5NH_2$

(2) $(CH_3)_3N$

(3) $C_6H_5NHC_6H_5$

(4) $CH_3CH_2$–NHCH$_3$

**4.** p-Chloroaniline and anilinium hydrochloride can not be distinguished by **[IIT-98]**

(1) Sandmeyer reaction

(2) $NaHCO_3$

(3) $AgNO_3$

(4) Carbylamine test

**5.** A positive carbylamine test is given by **[IIT-99]**

(1) N, N-Dimethylaniline

(2) 2, 4-Dimethylaniline

(3) N-Methyl-o-methylaniline

(4) N-methylbenzylamine

**6.** On heating benzyl amine with chloroform and ethanolic KOH, product obtained is :- **[AIEEE-2002]**

(1) benzyl alcohol (2) Benzaldehyde

(3) benozonitrile (4) Benzyl isocyanide

**7.** When benzamide is treated with $POCl_3$, the product formed is : **[IIT-04]**

(1) Benzonitrile (2) Aniline

(3) Chlorobenzene (4) Benzylamine

**8.** Which one of the following methods is neither means for the synthesis nor for separation of amines? **[AIEEE-2005]**

(1) Curtius reaction (2) Wurtz reaction

(3) Hofmann method (4) Hinsberg method

**9.** Reaction of cyclohexanone with dimethylamine in the presence of catalytic amount of an acid forms a compound. Water during the reaction is continuously removed. The compound formed is generally known as :- **[AIEEE-2005]**

(1) An amine

(2) An imine

(3) An enamine

(4) A Schiff's base

**10.** Fluorobenzene ($C_6H_5F$) can be sythesised in the laboratory :- **[AIEEE-2006]**

(1) By heating phenol with HF and KF

(2) From aniline by diazotisation followed by heating the diazonium salt with $HBF_4$

(3) By direct fluorination of benzene with $F_2$ gas

(4) By reacting bromobenzene with NaF solution

**11.** $CH_3NH_2 + CHCl_3 \xrightarrow{KOH}$ Product, Product is- **[IIT-2006]**

(1) $CH_3\text{–}\overset{\oplus}{N} \equiv \overset{\ominus}{C}:$ (2) $CH_3\text{–}\ddot{N} \equiv \overset{\oplus}{C}:$

(3) $CH_3$–NH–$CH_3$ (4) $CH_3$–C ≡ N

**12.** In the chemical reaction,

$CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow (A) + (B) + 3H_2O$, the compounds (A) and (B) are respectively - **[AIEEE-07]**

(1) $C_2H_5CN$ and 3KCl

(2) $CH_3CH_2$ $CONH_2$ and 3KCl

(3) $C_2H_5NC$ and $K_2CO_3$

(4) $C_2H_5NC$ and 3KCl

**13.** Which one of the following is the strongest base in aqueous solution - **[AIEEE-07]**

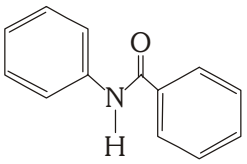
(1) Trimethylamine

(2) Aniline

(3) Dimethylamine

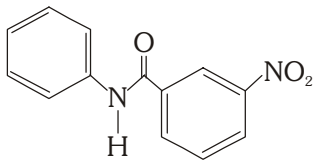
(4) Methylamine

**14.** In the following reaction,

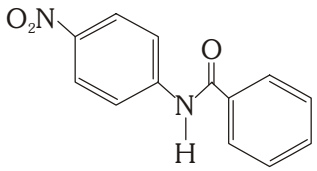


$\xrightarrow[\text{conc. } H_2SO_4]{\text{conc. } HNO_3}$ X, the structure of the major product 'X' is - **[IIT-07]**

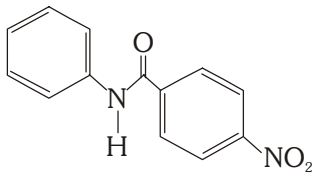
(1)



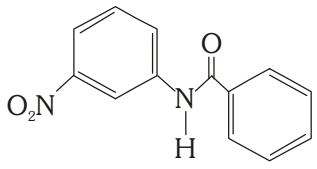
(2)



(3)



(4)



**15.** Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotized and then heated with cuprous bromide. The reaction mixture so formed contains **[AIEEE-2008]**

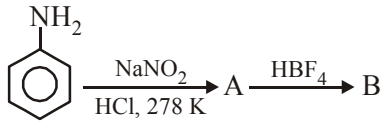
(1) mixture of o– and p–bromotoluenes

(2) mixture of o– and p–dibromobenzenes

(3) mixture of o– and p–bromoanilines

(4) mixture of o– and m–bromotoluenes

**16.** In the chemical reactions,



the compounds 'A' and 'B' respectively are :- **[AIEEE-2010]**

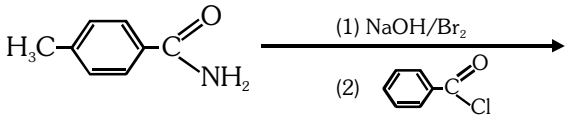
(1) Nitrobenzene and chlorobenzene

(2) Nitrobenzene and fluorobenzene

(3) Phenol and benzene

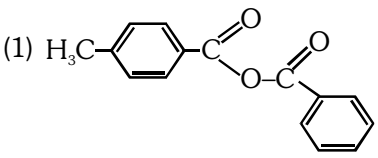
(4) Benzene diazonium chloride and fluorobenzene

**17.** In the reaction

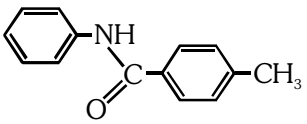


T the structure of the product T is - **[IIT-10]**

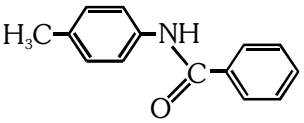
(1)



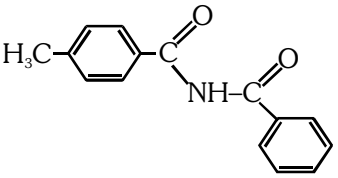
(2)



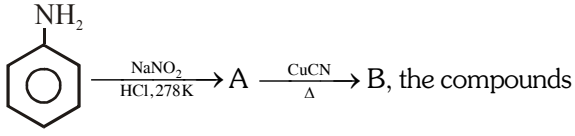
(3)



(4)



**18.** In the chemical reactions



A and B respectively are : **[AIEEE-2011]**

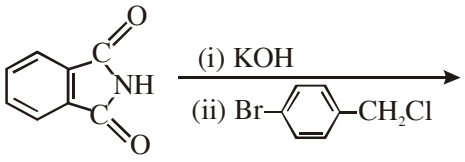
(1) Fluorobenzene and phenol

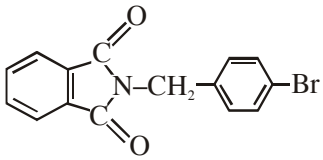
(2) Benzene diazonium chloride and benzonitrile

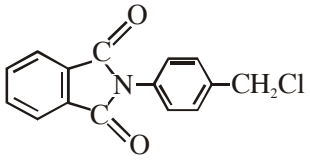
(3) Nitrobenzene and chlorobenzene

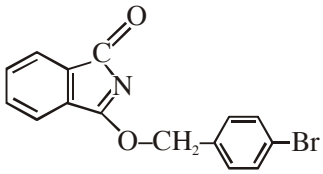
(4) Phenol and bromobenzene

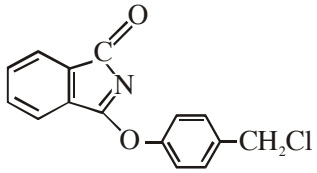
**19.** The major product of the following reaction is **[IIT-2011]**



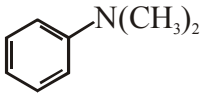

(1) 

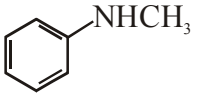

(2) 

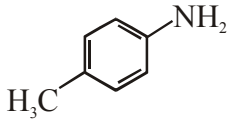

(3) 

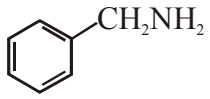

(4) 


**20.** Amongst the compounds given, the one that would form a brilliant coloured dye on treatment with $NaNO_2$ in dil. HCl followed by addition to an alkaline solution of β-naphthol is - **[IIT-2011]**

(1) 


(2) 


(3) 


(4) 


**21.** A compound with molecular mass 180 u is acylated with $CH_3COCl$ to get a compound with molecular mass 390 u. The number of amino groups present per molecule of the former compound is :- **[JEE(MAIN)-2013]**

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

**22.** An organic compound A upon reacting with $NH_3$ gives B. On heating, B gives C. C in presence of KOH reacts with $Br_2$ to give $CH_3CH_2NH_2$. A is :- **[JEE(MAIN)-2013]**

(1) $CH_3COOH$ (2) $CH_3CH_2CH_2COOH$

(3) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-COOH$ (4) $CH_3CH_2COOH$

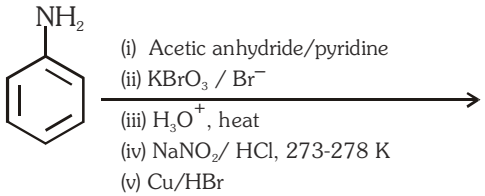
**23.** On heating an aliphatic primary amine with chloroform and ethanolic potassium hydroxide, the organic compound formed is :- **[JEE(MAIN)-2014]**

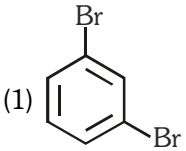
(1) an alkyl cyanide
(2) an alkyl isocyanide
(3) an alkanol
(4) an alkanediol

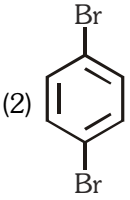
**24.** In the Hofmann bromamide degradation reaction, the number of moles of NaOH and $Br_2$ used per mole of amine produced are : **[JEE(MAIN)-2016]**

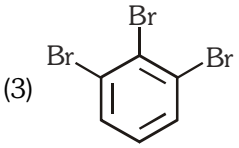
(1) Four moles of NaOH and one mole of $Br_2$
(2) One mole of NaOH and one mole of $Br_2$
(3) Four moles of NaOH and two moles of $Br_2$
(4) Two moles of NaOH and two moles of $Br_2$

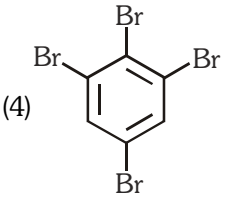
**25.** The product(s) of the following reaction sequence is(are) **[JEE Adv. 2016]**



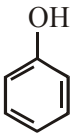

(1) 

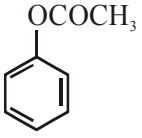

(2) 

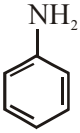

(3) 

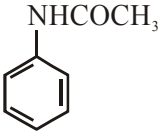

(4) 


**26.** Which of the following compounds will significant amont of meta product during mono-nitration reaction ? **[JEE(MAIN)-2017]**

(1) 


(2) 


(3) 


(4) 


| PREVIOUS YEARS QUESTIONS | | | | ANSWER KEY | | | | | | Exercise-II |
|---|---|---|---|---|---|---|---|---|---|---|
| Que. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Ans. | **3** | **2** | **1** | **2** | **2** | **4** | **1** | **2** | **3** | **2** |
| Que. | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Ans. | **1** | **4** | **3** | **2** | **1** | **4** | **3** | **2** | **1** | **3** |
| Que. | 21 | 22 | 23 | 24 | 25 | 26 | | | | |
| Ans. | **2** | **4** | **2** | **1** | **4** | **3** | | | | |