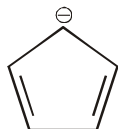


Aromatic compounds, Arly Halides (Haloarenes)

EXERCISES

ELEMENTARY

Q.1 (3)



6πe are present in compound

Q.2 (2)

10.5 gram carbon Per hydrogen

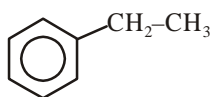
$$C = \frac{10.5}{12} \Rightarrow \frac{7}{8}$$

$$H = \frac{1}{1} = 1$$



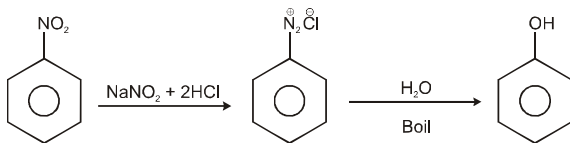
Q.3 (3)

Q.4 (3)



Benzylic carbon has 2 hydrogen ethyl benzene.

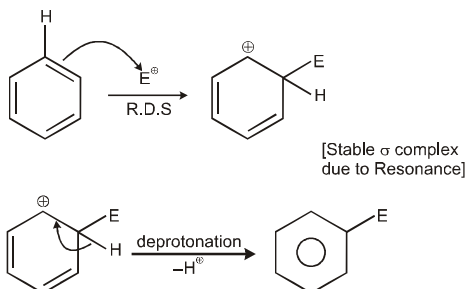
Q.5 (1)



Q.6 (2)

Rate of electrophilic substitution reaction \propto Stability of arenium ion.

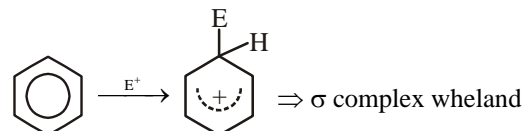
Q.7 (3)



Isotopic effect is not operate because removal of proton is not R.D.S So isotopic benzen having equal rate for E.S.R. with respect to benzen

$$K_{C_6H_6} = K_{C_6D_6} = K_{C_6T_6}$$

Q.8 (4)



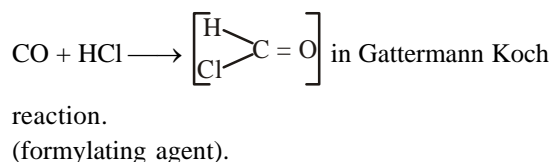
intermediate benzenium cation.

Q.9 (4)

Q.10 (4)

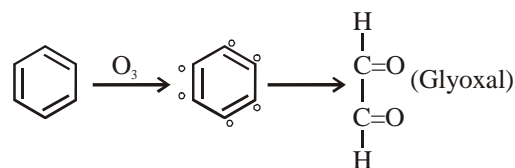
CH₃ group in toluene is o, p-position direction activator.

Q.11 (1)



Q.12 (2)

Q.13 (4)



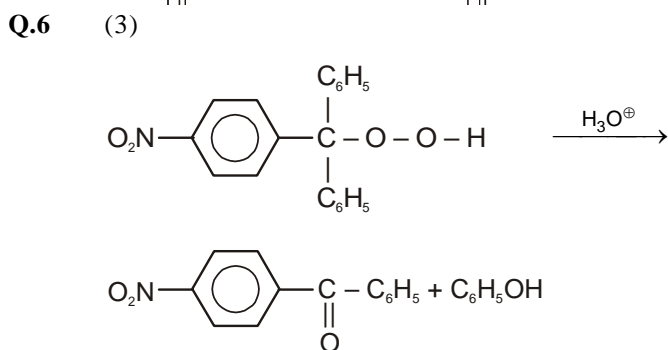
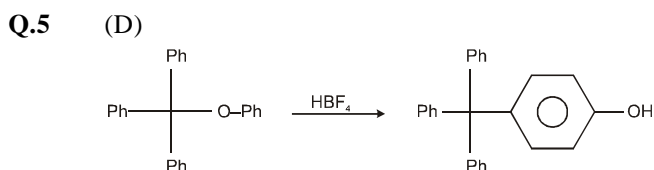
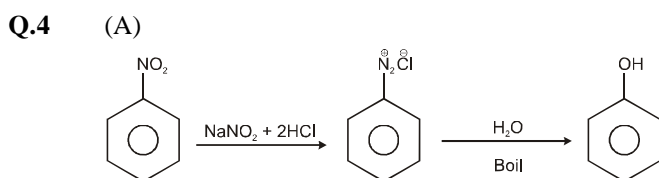
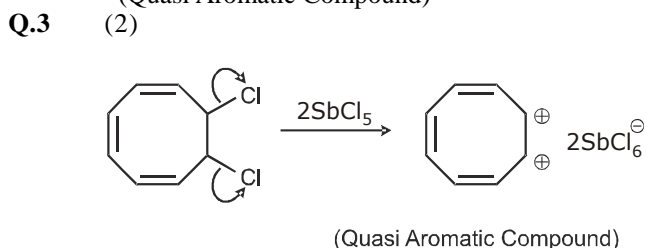
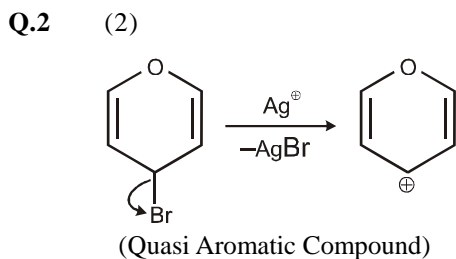
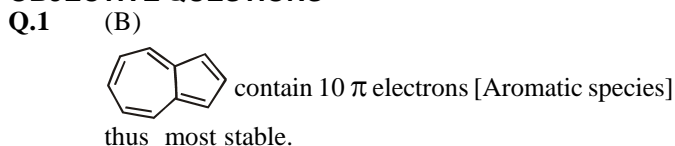
Q.14 (3)

Aromatic and aliphatic alcohols can be distinguished by FeCl₃ test.

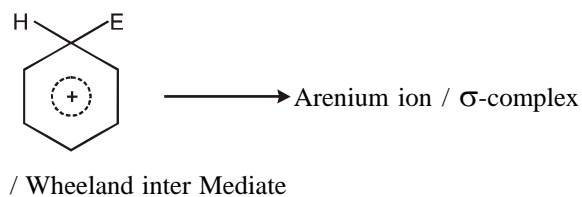
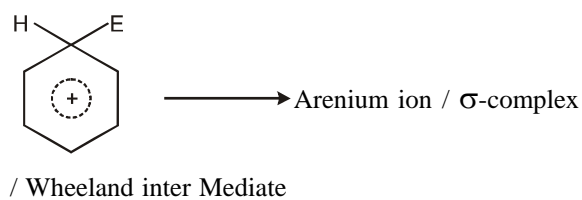
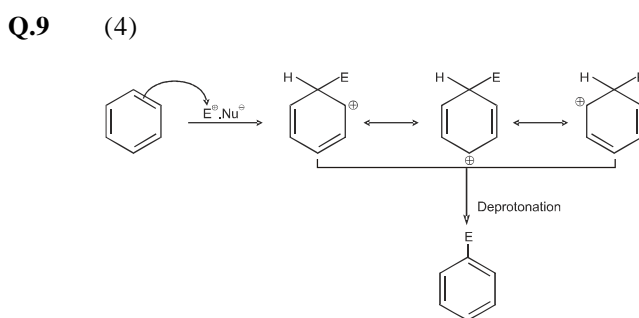
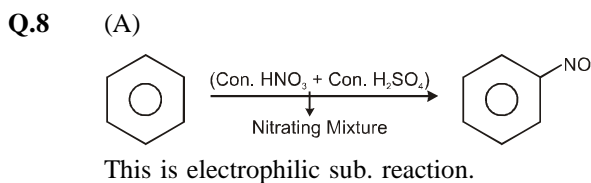
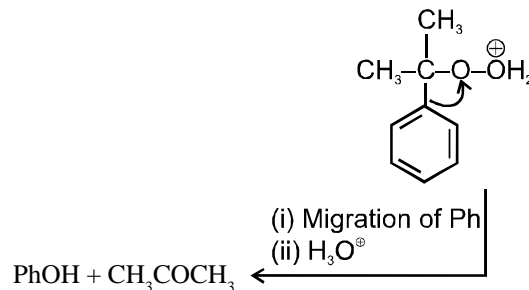
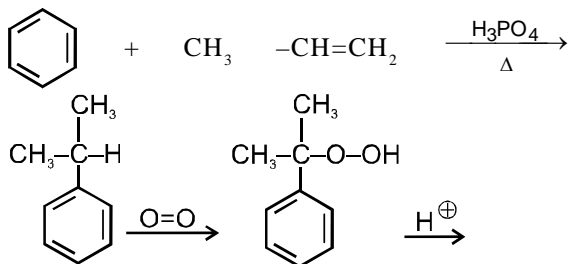
Q.15 (1)

Benzaldehyde and formaldehyde give Cannizzaro reaction.

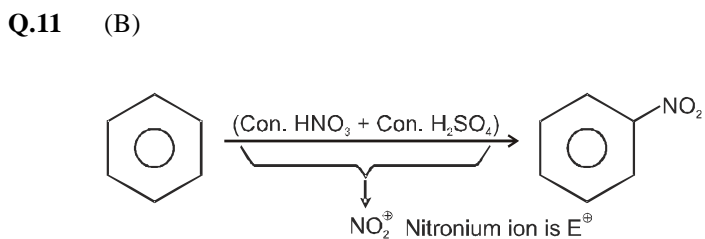
JEE-MAIN
OBJECTIVE QUESTIONS



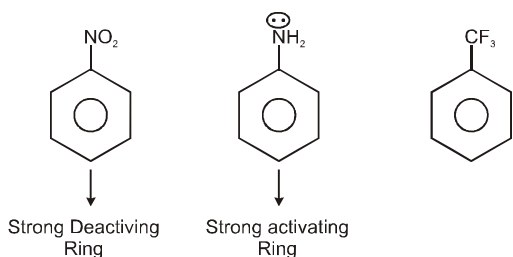
Q.7 (3) Benzoic acid & acetone
 (4) Phenol & acetone
 (4)



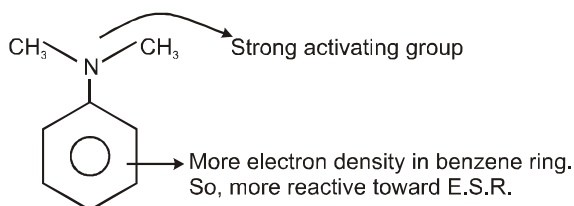
Q.10 (2)
 Anhydrous AlCl_3 _____ is best reagent for friedel craft Halogenation.



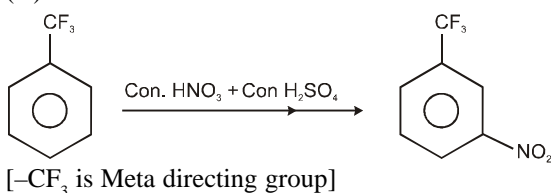
Q.12 (4)



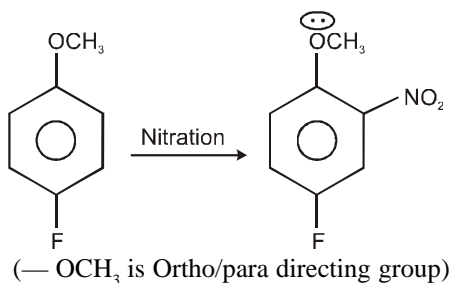
Q.13 (1)



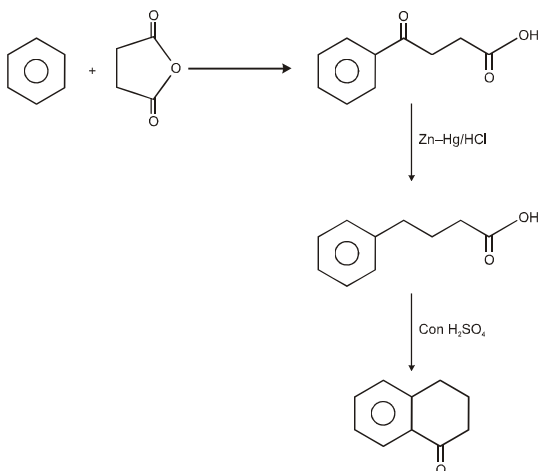
Q.14 (B)



Q.15 (2)



Q.16 (1)

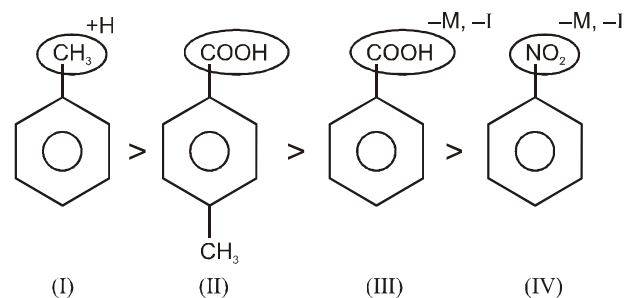


Q.17 (1)

Rate of electrophilic substitution \propto Stability of arenium ion.

Q.18 (3)

Decreasing reactivity order for bromination (E.S.R.)

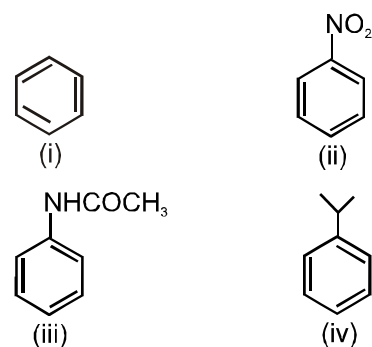


Q.19 (B)

$-\text{CCl}_3, -\text{NO}_2, -\text{CHO} \longrightarrow$ Meta directing group

$-\text{O}^\ominus \longrightarrow$ ortho / Para directing

Q.20 (4)

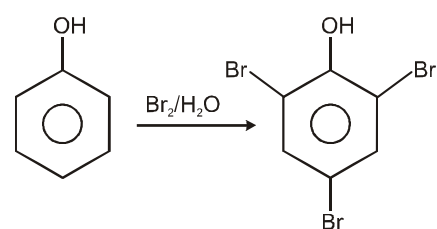


thus reactivity order towards electrophilic substitution reaction is $\text{iii} > \text{iv} > \text{i} > \text{ii}$

Q.21 (1)

Electro releasing order of $\text{OH} > \text{CH}_3 > \text{Br} > \text{NO}_2$.

Q.22 (4)

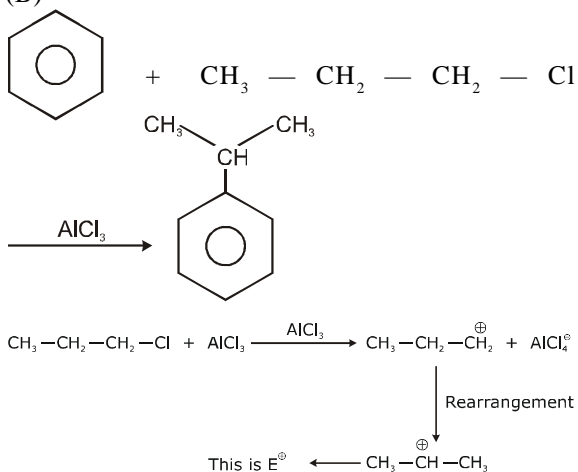


2, 4, 6 Tribromophenol.

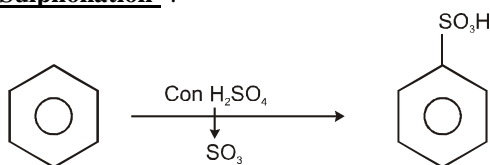
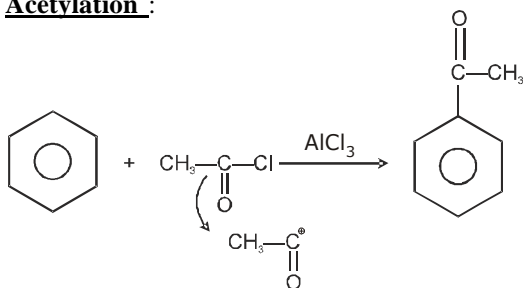
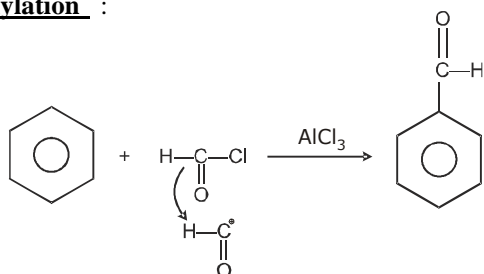
Q.23 (3)

In alkylation of benzene polyalkylated products are formed.

Q.24 (B)



Q.25

 (2)
Sulphonation :

Acetylation :

Formylation :


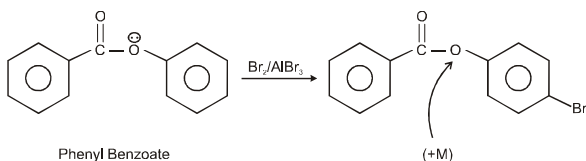
Q.26 (3)

 Reactivity towards electrophile \propto Electron releasing group.

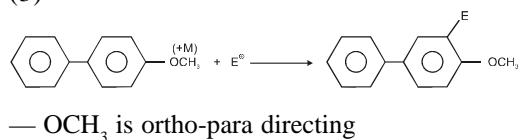
Q.27 (1)

 Reactivity towards bromination \propto Stability of arenium ion.

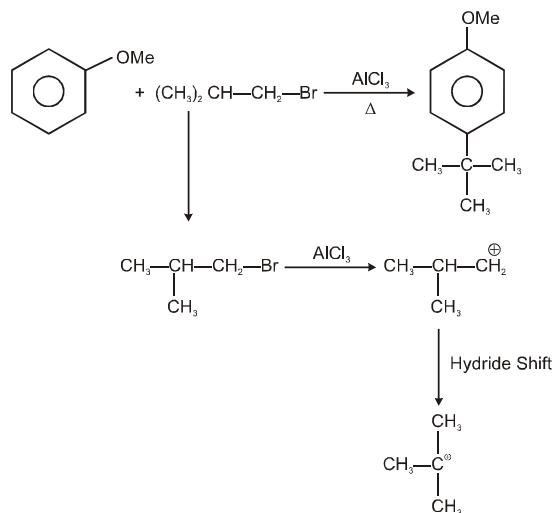
Q.28 (4)



Q.29 (3)



Q.30 (4)



Q.31 (2)

 In sulphonation SO_3 is electrophile species.

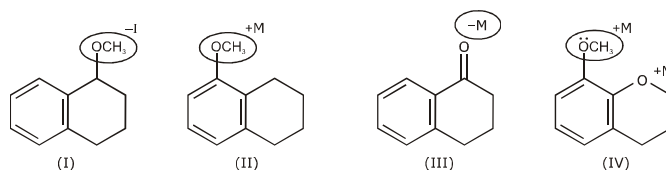
Q.32 (2)



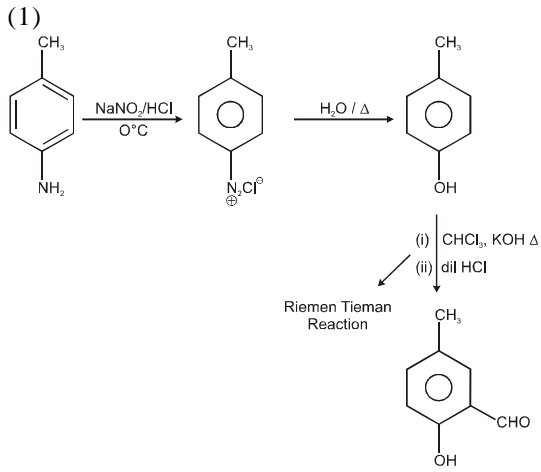
Q.33 (4)

In vinyl chloride lone pair of Cl atom take part in conjugation so partial double bond character between C—Cl bond.

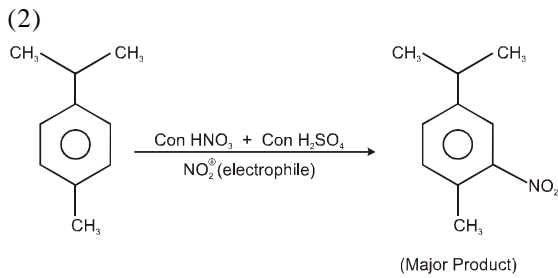
Q.34 (1)


 Increasing order of rate of reaction with $\text{Br}_2/\text{AlBr}_3$

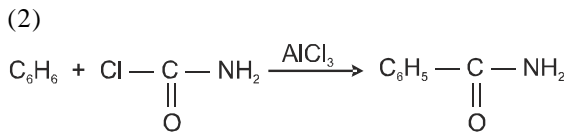

Q.35



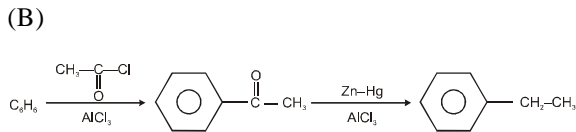
Q.36



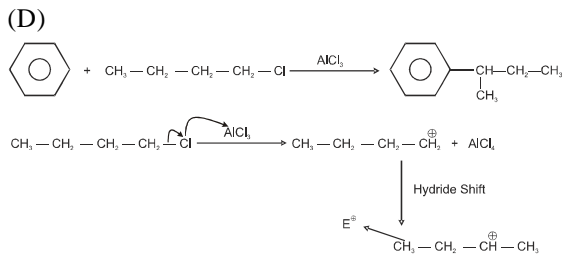
Q.37



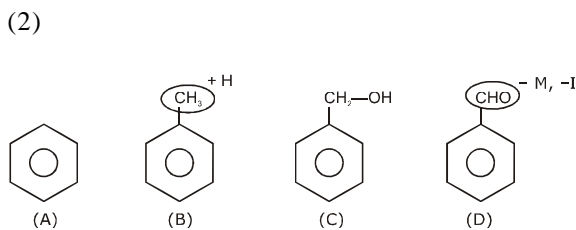
Q.38



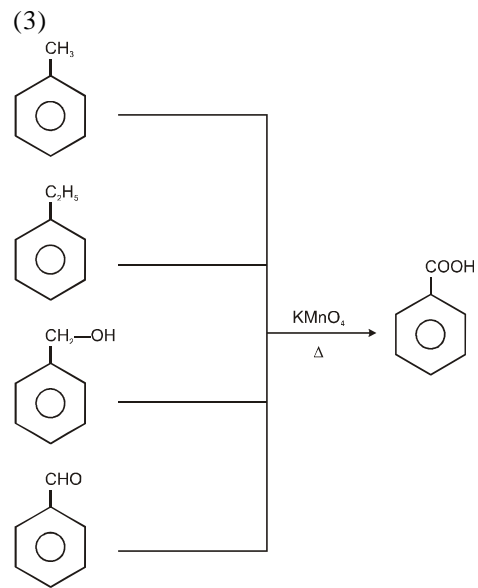
Q.39



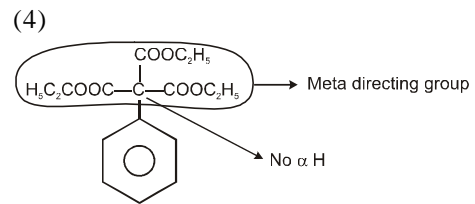
Q.40



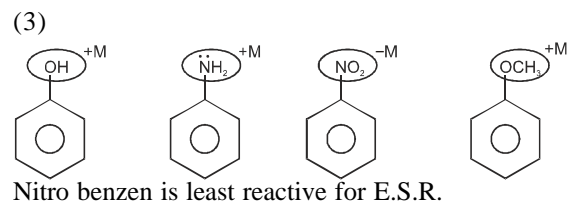
Q.41



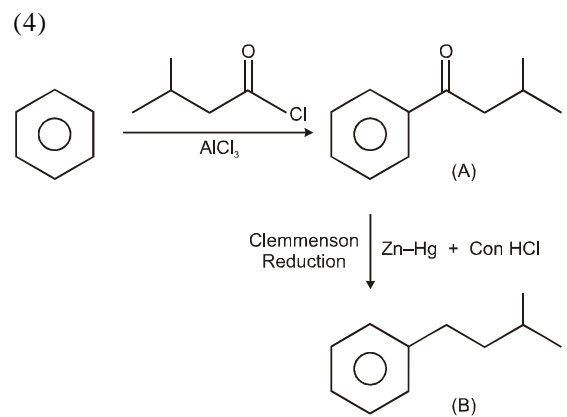
Q.42



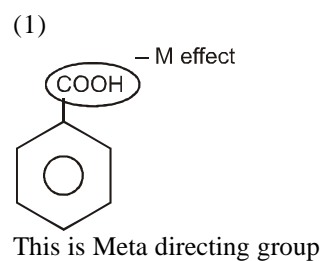
Q.43

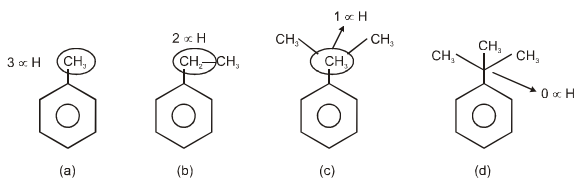


Q.44



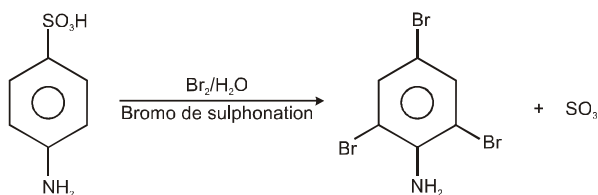
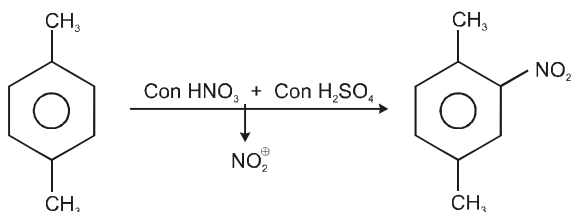
Q.45

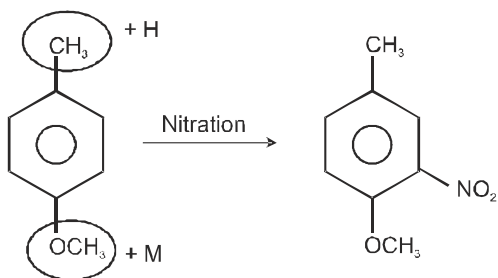


Q.46 (2)

 Reactivity order for E.S.R. \longrightarrow a > b > c > d

Q.47 (1)

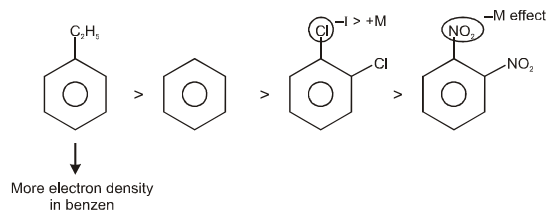
 In meta xylene both CH_3 groups increases electron density at same carbons.

Q.48 (1)

Q.49 (3)

 $-\text{CH}_3$ group is ortho/para directing. One product is obtained.

Q.50 (2)

 $-\ddot{\text{O}}\text{CH}_3$ is ortho-para directing and more electron density at ortho/para position.

Q.51 (3)

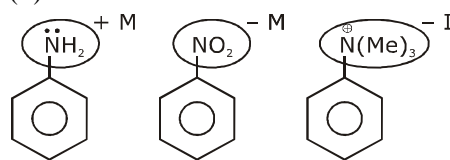
Correct reactivity order for E.S.R.

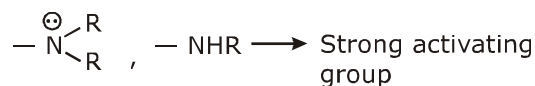
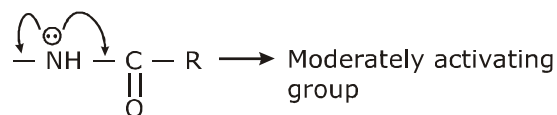

Q.52 (2)

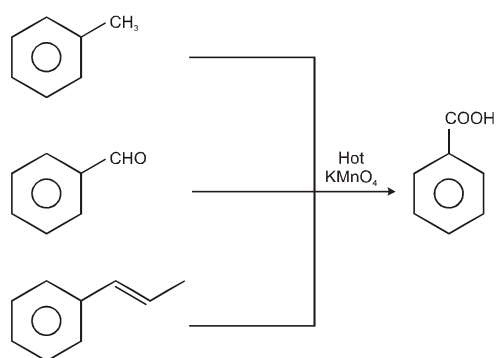
 Orientation decided by more activating $-\text{OH}$ group.

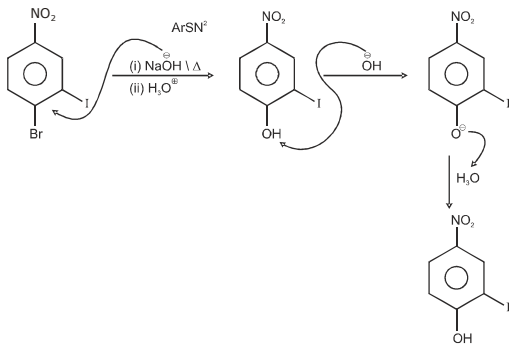
Q.53 (1)

 Orientation decided by more activating $-\text{OH}$ group [+ M effect].

Q.54 (1)

 \Rightarrow do not show Friedel crafts reaction

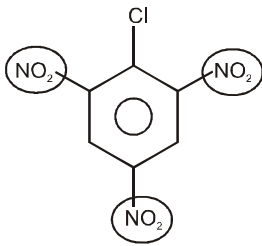
Q.55 (2)

Q.56 (C)

Q.57 (4)

Q.58 (2)



Q.59 (2)
Because rate of S_N2 Ar is $-F > -Cl > -Br > -I$

Q.60 (4)

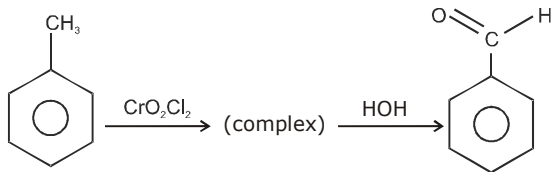


Strong $-M$ effect is activating for $ArSN_2$ group
So, more reactive towards

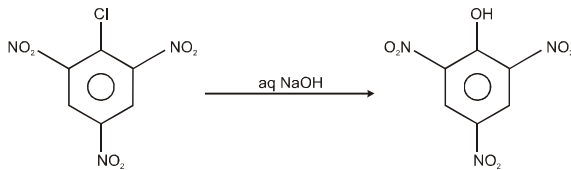
Nucleophilic sub. reaction

($ArSN_2$)

Q.61 (2)

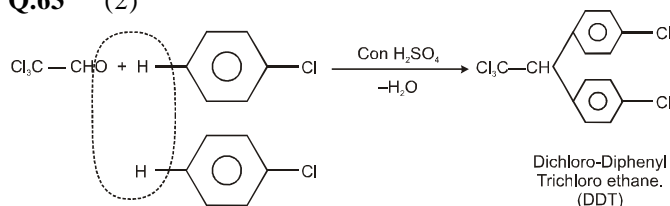


Q.62 (1)

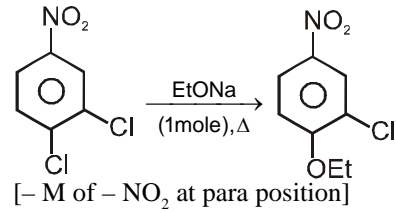


(nucleophilic substitution reaction)

Q.63 (2)



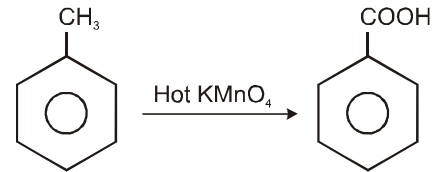
Q.64 (1)



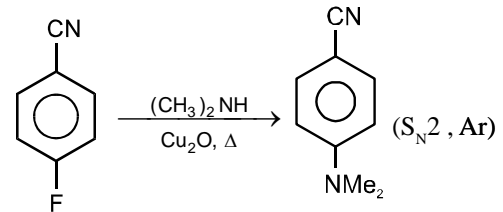
Q.65 (2)

$-M$ of $-NO_2$ at $-Cl$ is best in B.

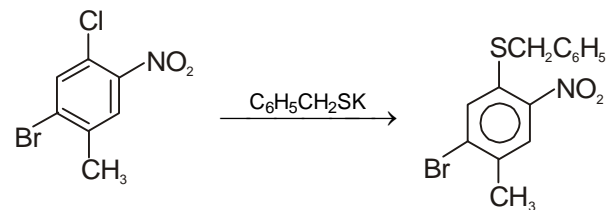
Q.66 (C)



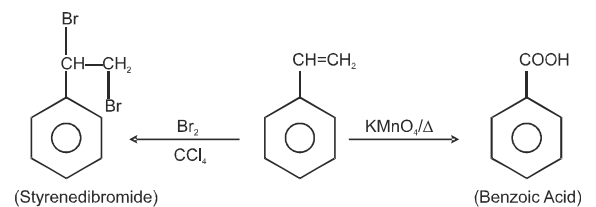
Q.67 (2)



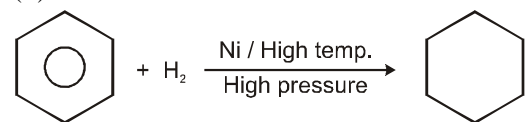
Q.68 (3)

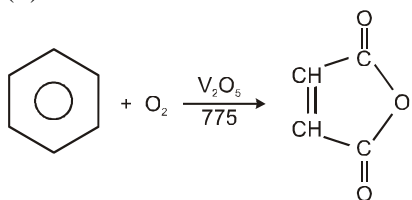


Q.69 (4)



Q.70 (1)



Q.71 (4)

Q.72 (1)

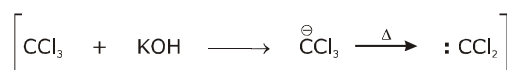
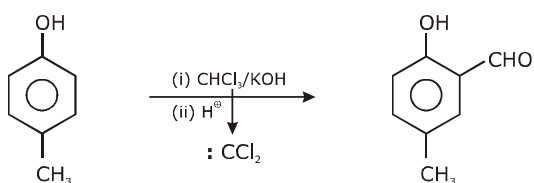
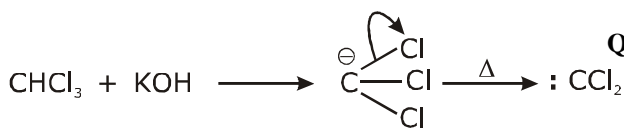
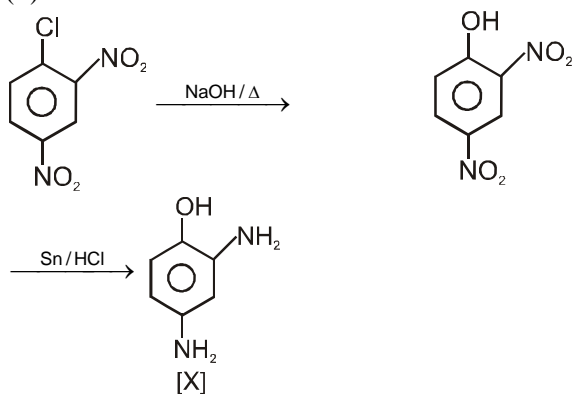
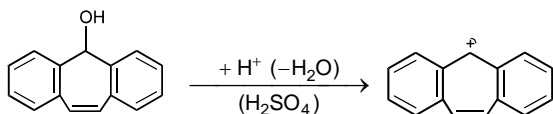
It is nucleophilic aromatic substitution reaction.

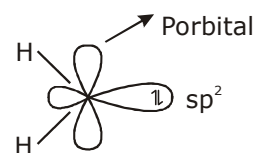
Q.73 (4)

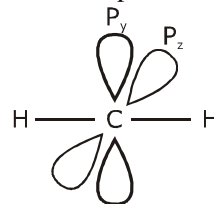
 $\text{S}_{\text{N}}2$ Ar is obtained.

Q.74 (4)

(Nucleophilic aromatic Substitution Reaction)

Q.75 (3)

Q.76 (1)

Q.77 (2)

Q.78 (2)

Q.79 (1)

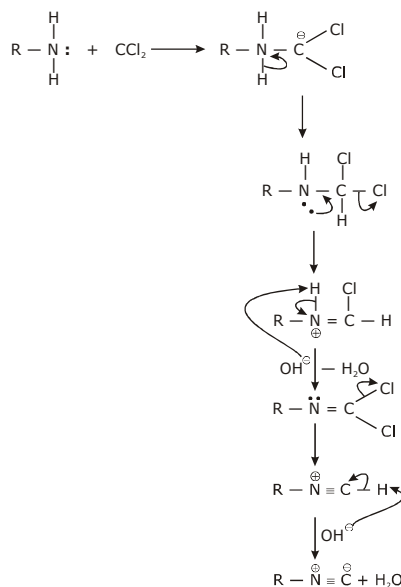
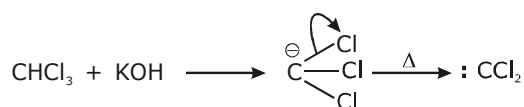
 Single carbene \rightarrow two non bonding electron are present in one sp^2 hybridized orbital.

Q.80 (3)

 Two non bonding electron are present in different orbital so triplet carbene having sp hybridized.

Q.81 (4)

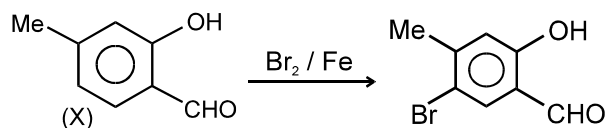
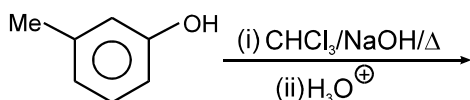
Secondary amine are not gives. Carbylamine reaction/ isocyanide test.

Q.82 (1)

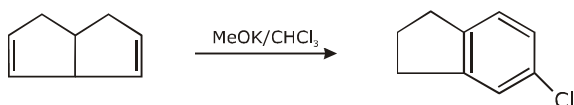
Sec. amine does not gives Hoffmann's carbyl amine test.

Q.83 (3)


Q.84 (3)



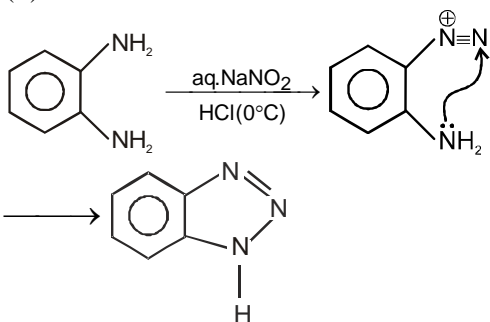
Q.85 (3)



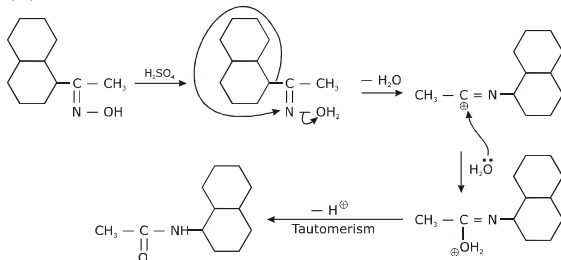
Q.86 (2)

NH_4HS is selective reducing agent.

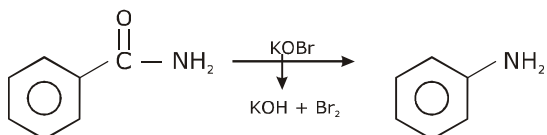
Q.87 (4)



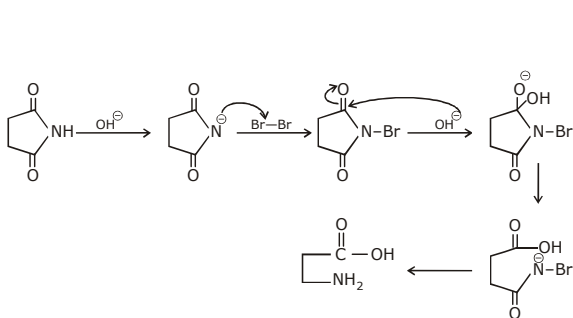
Q.88 (2)



Q.89 (2)

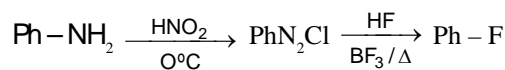


Q.90 (1)

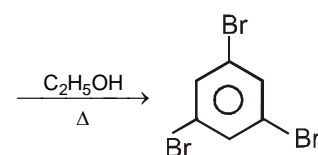
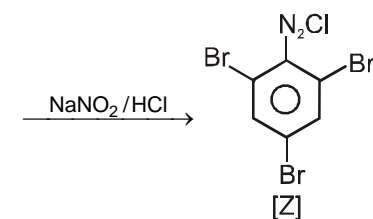
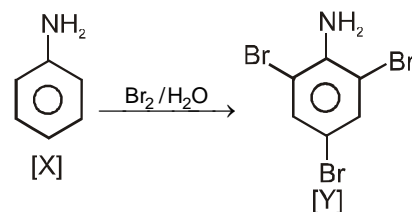


Q.91 (4)

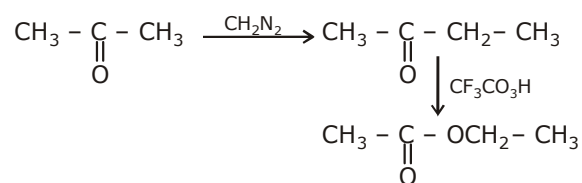
Amongst the following the moderately activating group is-



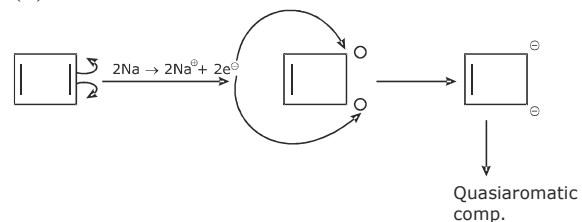
Q.92 (4)



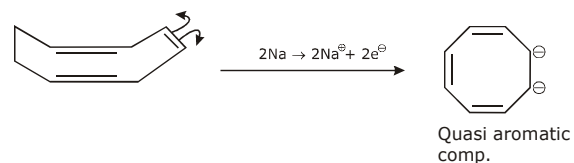
Q.93 (3)

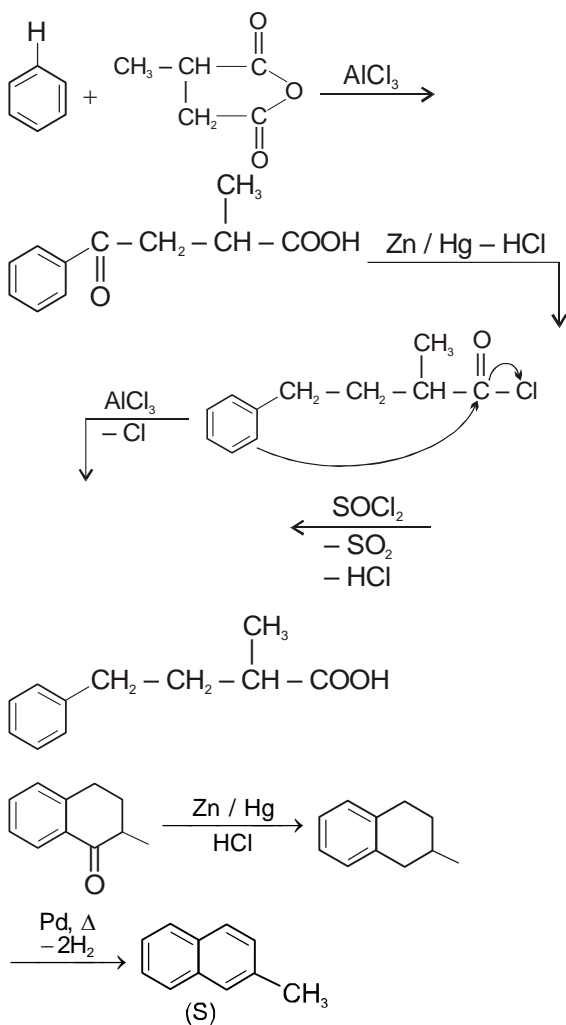
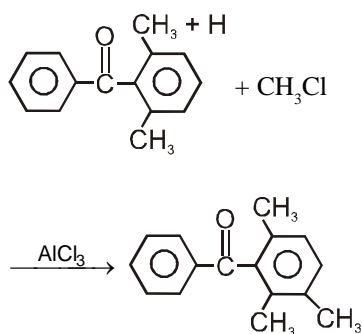
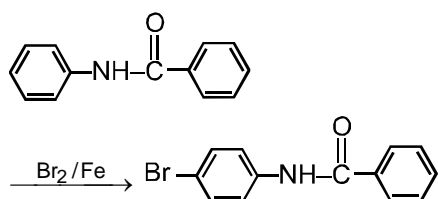
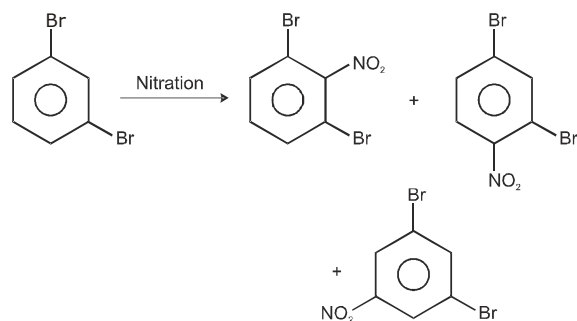
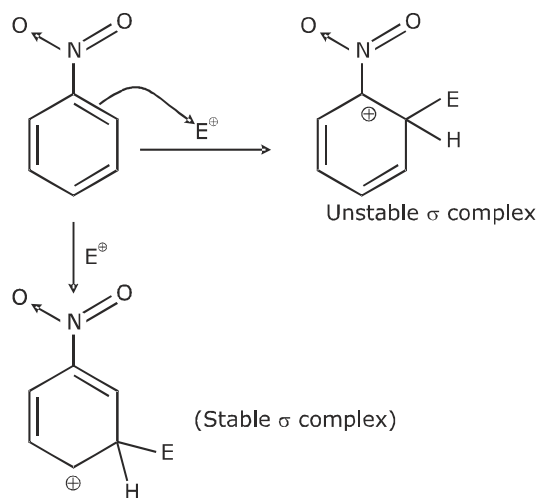
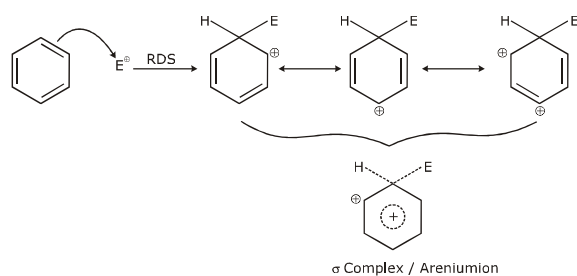


Q.94 (2)

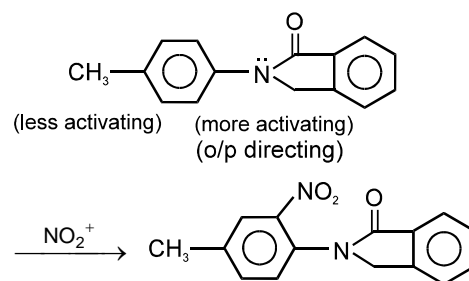


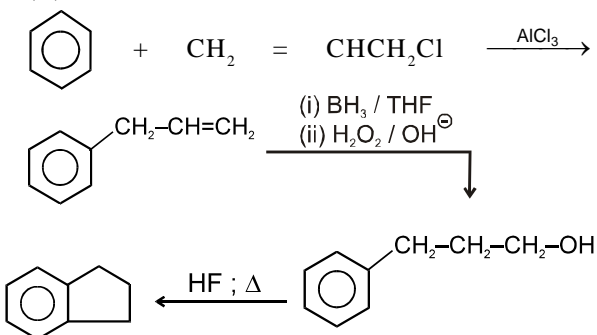
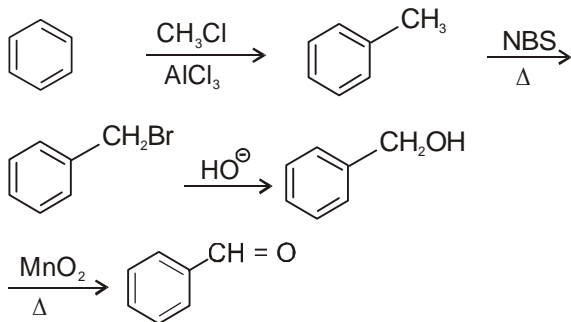
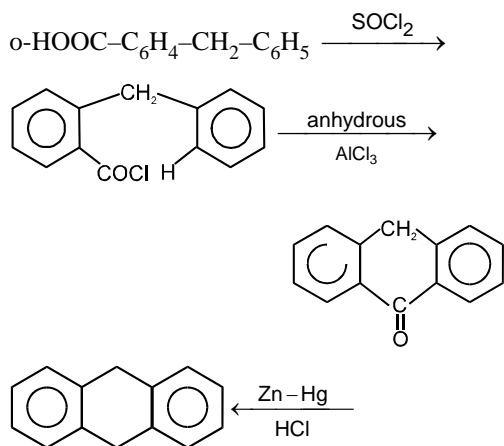
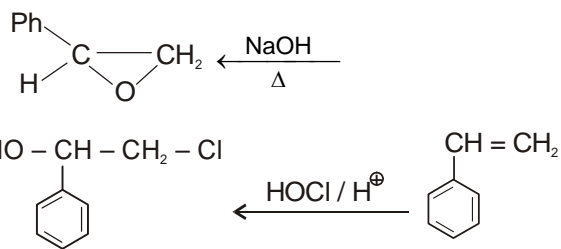
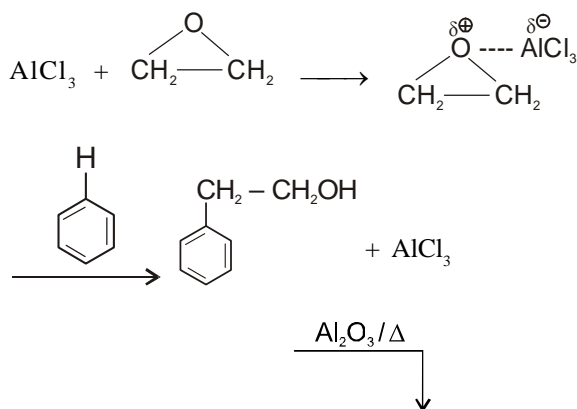
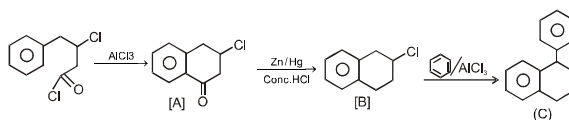
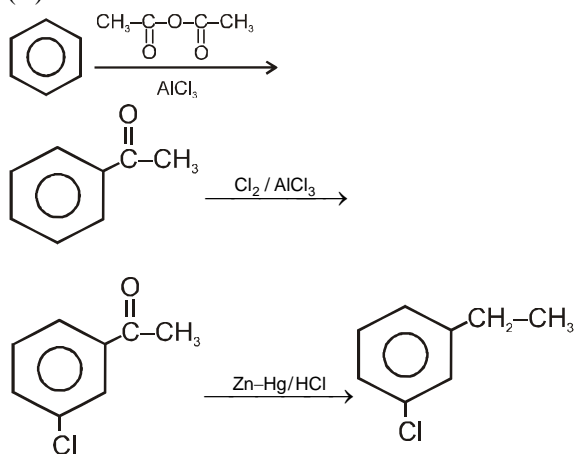
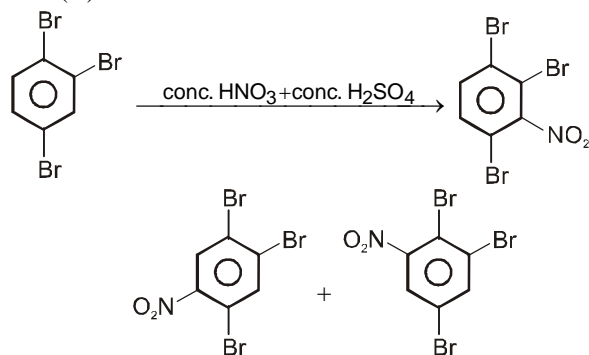
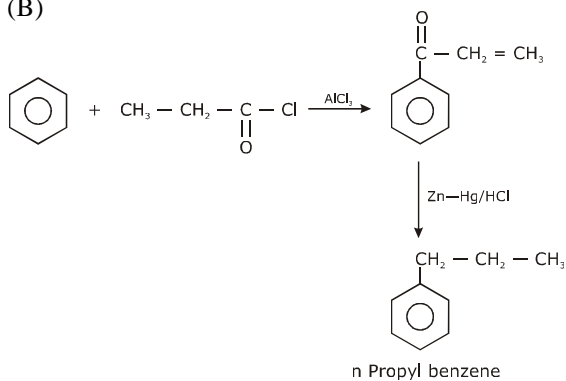
Q.95 (2)



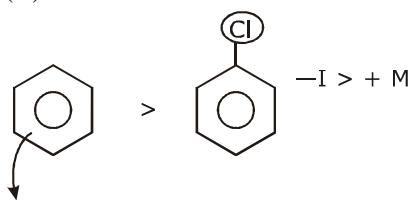
**JEE-ADVANCED
OBJECTIVE QUESTIONS**
Q.1 (B)

Q.2 (C)

Q.3 (B)

Q.4 (B)

Q.5 (D)

Q.6 (A)

Q.7 (A)

Electrophile attacks on that ring which has more +M effect.

Q.8 (C)


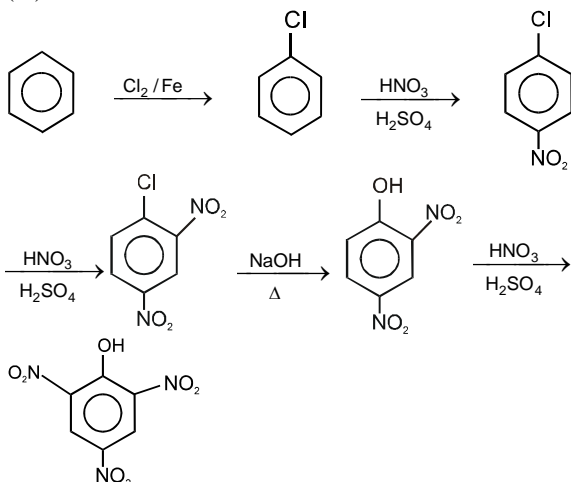
Q.18 (C)

Q.19 (B)

Q.20 (C)

Q.21 (A)

Q.22 (B)

Q.23 (A)

Q.24 (B)

Q.25 (B)


Q.26 (C)

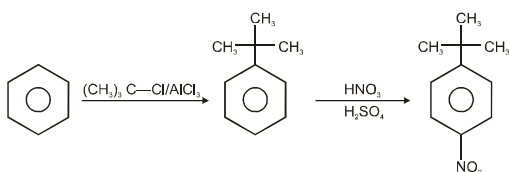


More electron density

Q.27 (D)

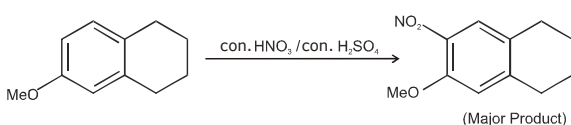


Q.28 (B)



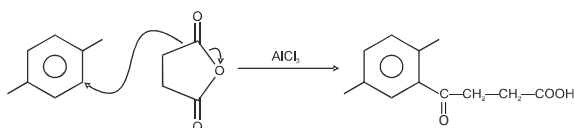
Q.29 (B)

Q.30 (C)

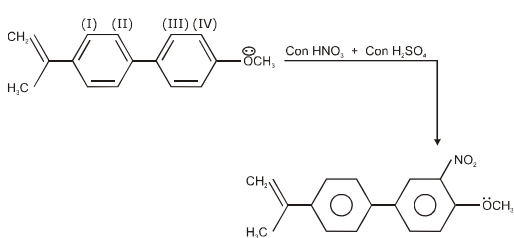


—ÖMe → ortho-Para directing group

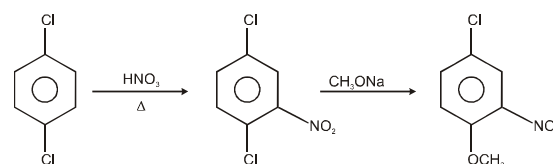
Q.31 (B)



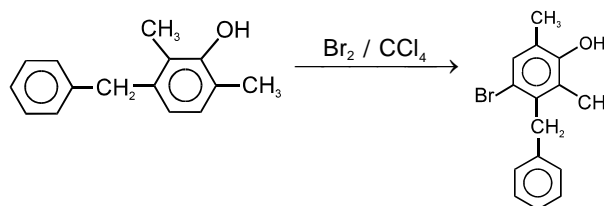
Q.32 (D)

—OCH₃ is Ortho / Para directing or activating group.

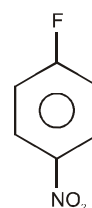
Q.33 (A)



Q.34 (B)

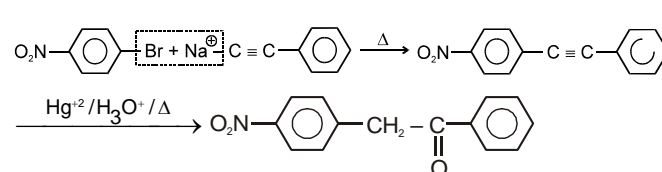


Q.35 (B)

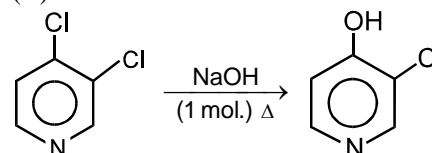


This comp is more reactive toward Nu aromatic sub reaction because F having small size and less sterical hindrence.

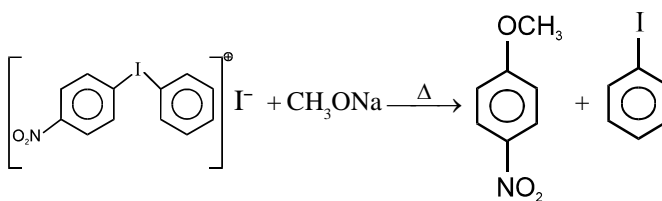
Q.36 (C)



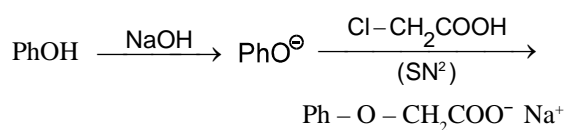
Q.37 (B)



Q.38 (A)

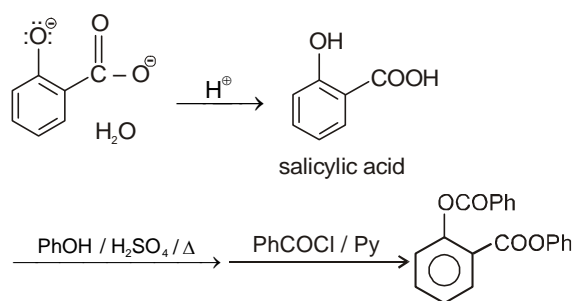
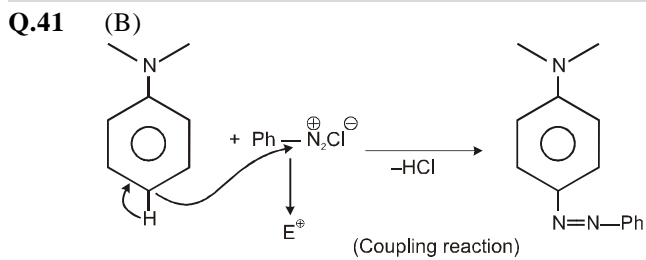


Q.39 (D)

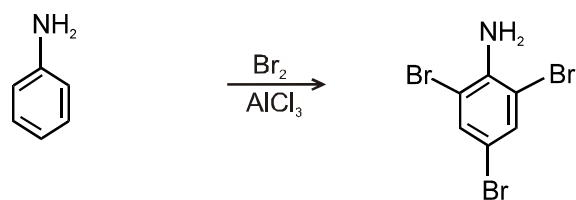
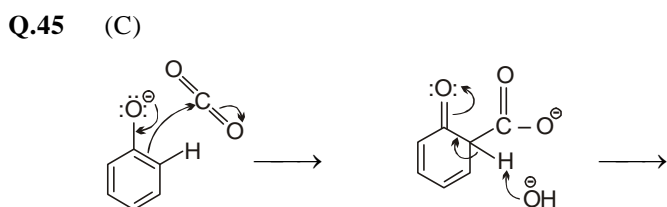
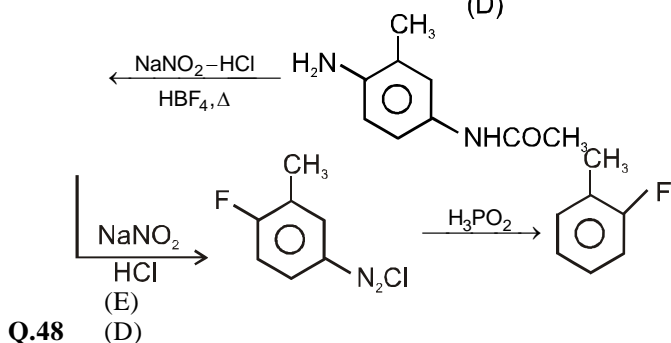
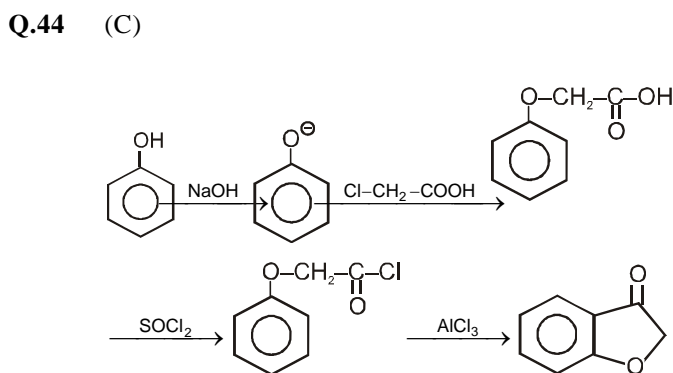
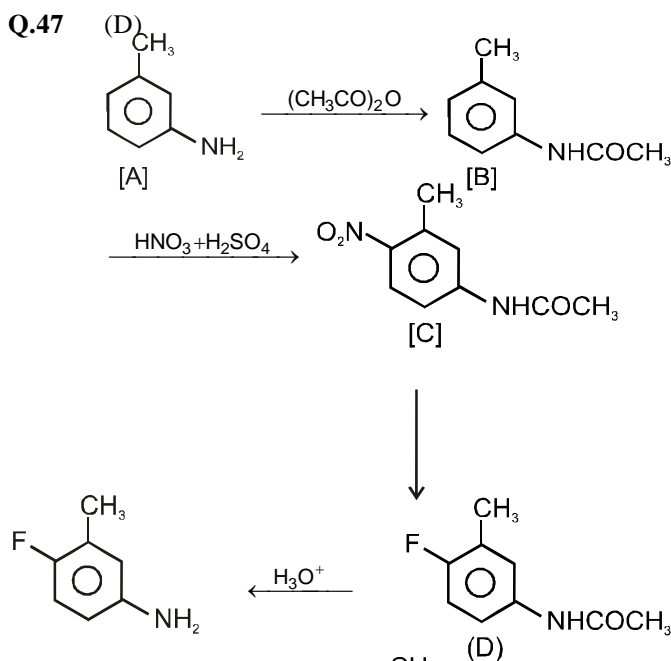
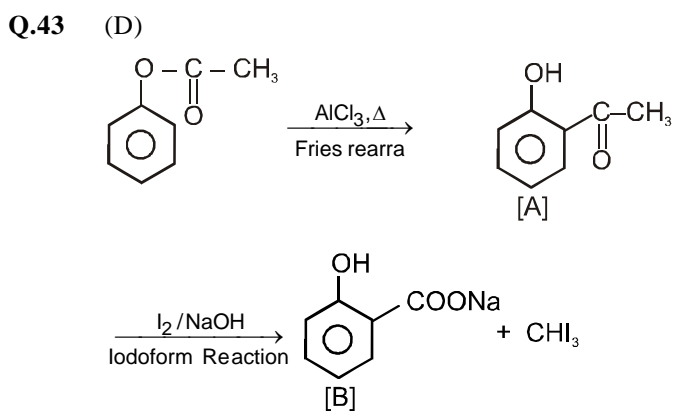
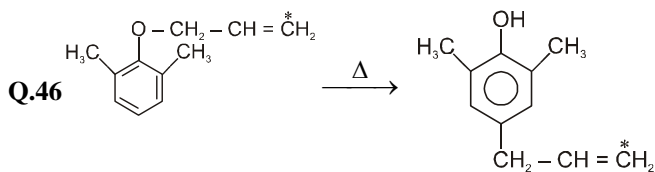
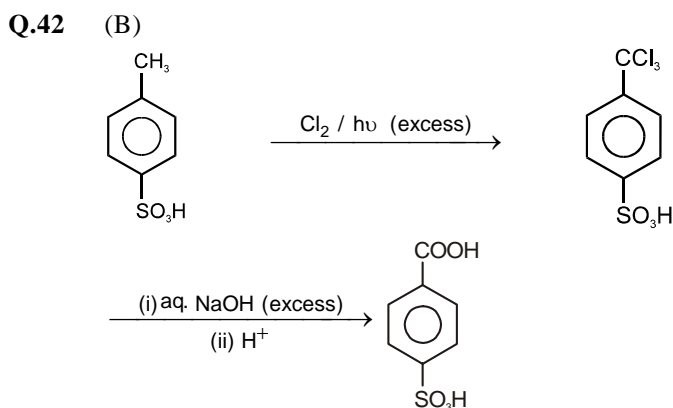


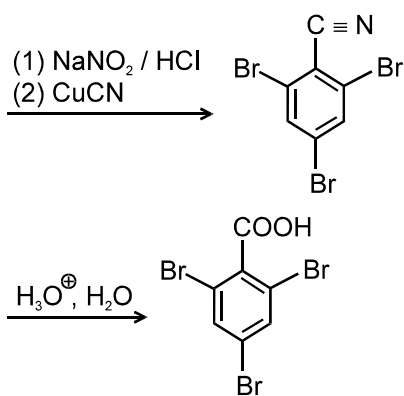
Q.40 (B)

C¹ - C² - is shorter because it is double bond in two of three resonance structure ; C₂-C₃ is a single bond in two of three resonance structures.

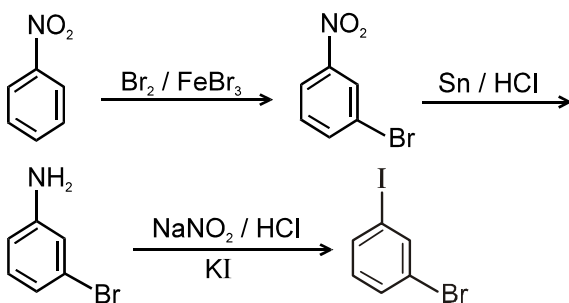


Phenoxide ions are so strongly activated that they undergo electrophilic aromatic substitution with CO₂, a weak electrophile.

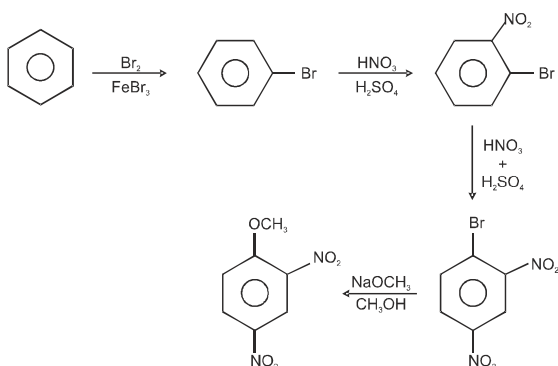




Q.49 (C)



Q.50 (A)



Q.51 (A)

Phenol prefer coupling in Basic medium.

Q.52 (B)

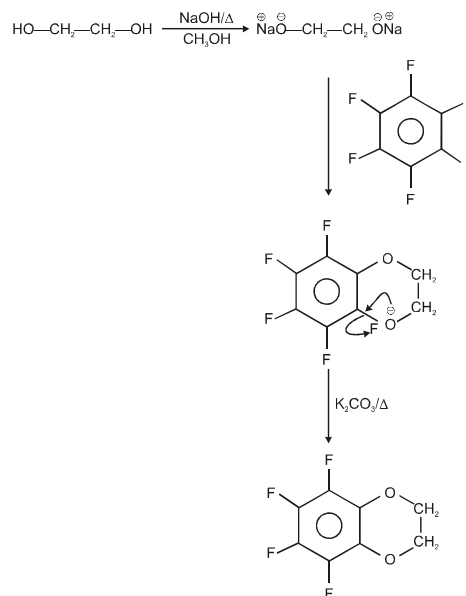
Aniline prefer coupling in acidic medium .

Q.53 (A)

The electron-attracting $-\text{NO}_2$ stabilizes ring A . of 1-nitronaphthalene to oxidation, and ring B is oxidized to form 3-nitrophthalic acid. By orbital overlap, -

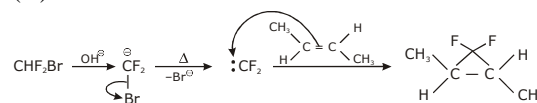
••
 NH_2 releases electron density, making ring A more susceptible to oxidation, and α -naphthylamine is oxidized to phthalic acid.

Q.54 (C)

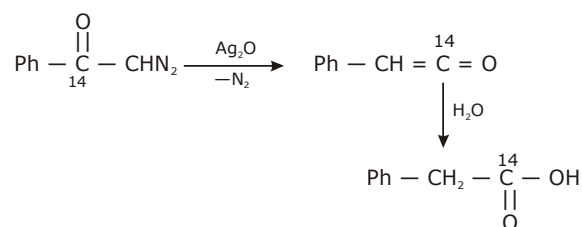


Q.55 (D)

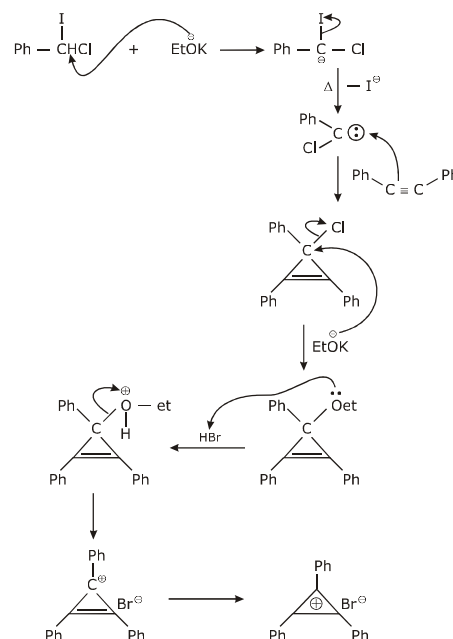
Q.56 (C)

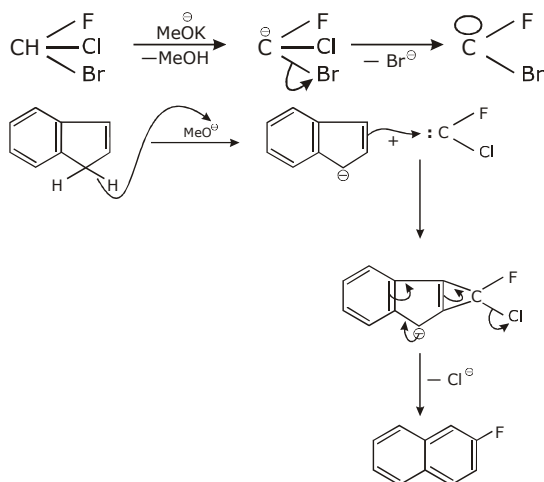
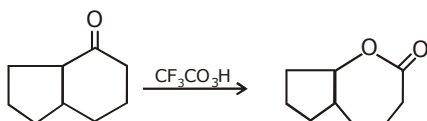
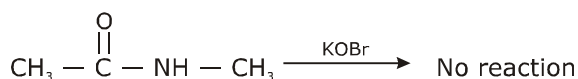
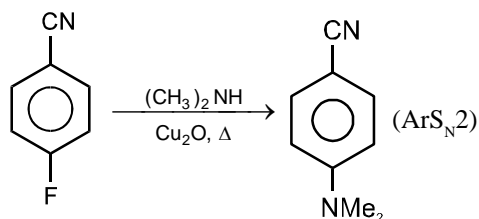
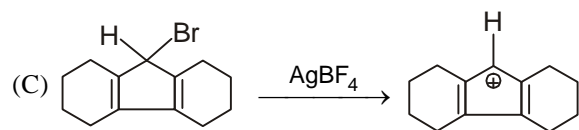
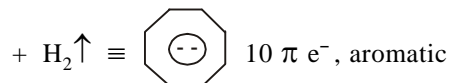
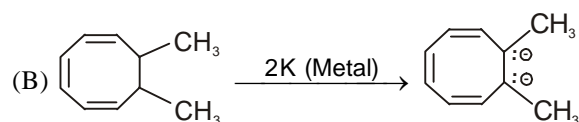
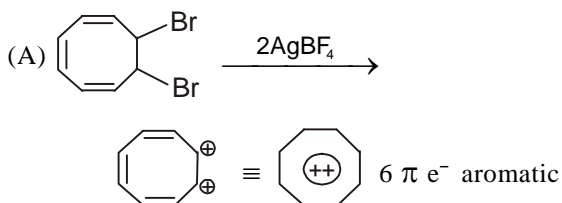


Q.57 (B)

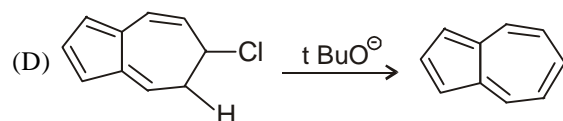


Q.58 (C)



Q.59 (A)

Q.60 (C)

Q.61 (A)

Q.62 (C)
Q.63 (B)

JEE-ADVANCED
MCQ/COMPREHENSION/COLUMN MATCHING
Q.1 (ABD)


$4\pi e^-$, antiaromatic



$10\pi e^-$, aromatic

Q.2 (ABCD)

Aromatic \rightarrow planar, cyclic, $(4n+2)\pi e^-$, complete conjugation

Antiaromatic \rightarrow planar, cyclic, $(4n)\pi e^-$, complete conjugation

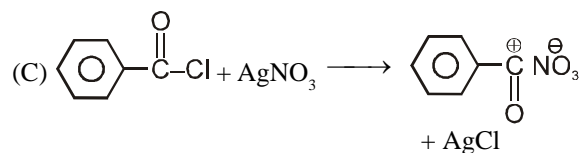
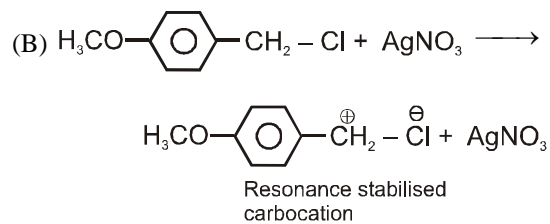
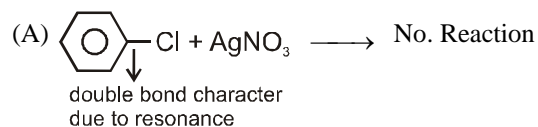
Non aromatic - cyclic structure with non-planar geometry with any hybridization

Q.3 (ABC)

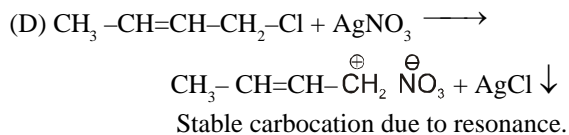
Aromatic \rightarrow planar, cyclic, $(4n+2)\pi e^-$, complete conjugation

Q.4 (AC)

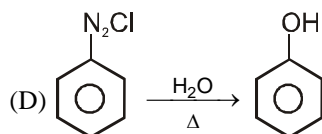
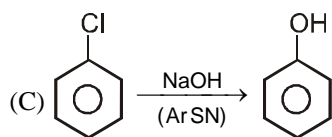
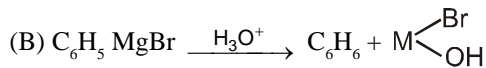
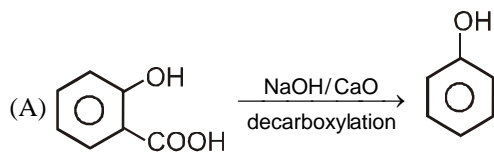
Aromatic \rightarrow planar, cyclic, $(4n+2)\pi e^-$, complete conjugation

Q.5 (BCD)


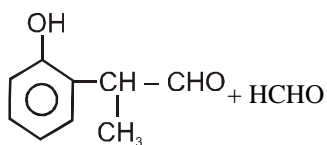
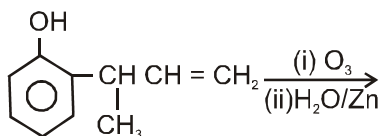
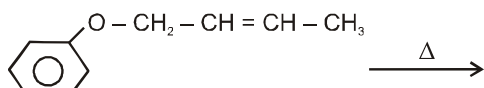
Stable due to backbonding



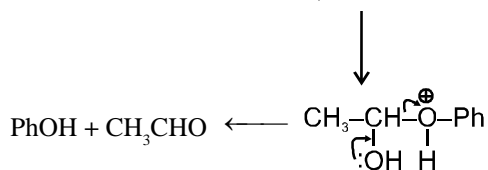
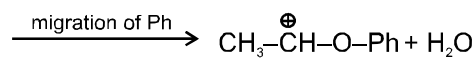
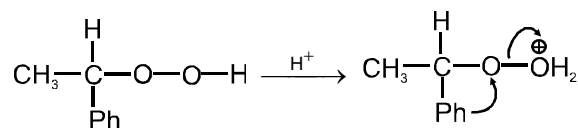
Q.6 (ACD)



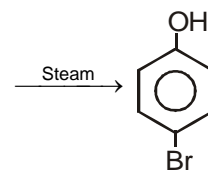
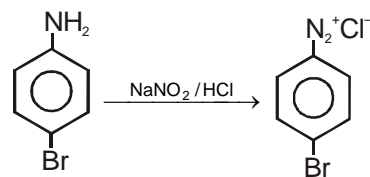
Q.7 (ABC)



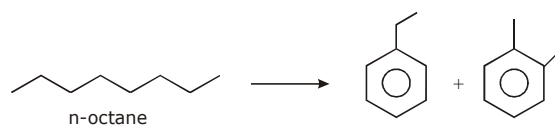
Q.8 (AC)



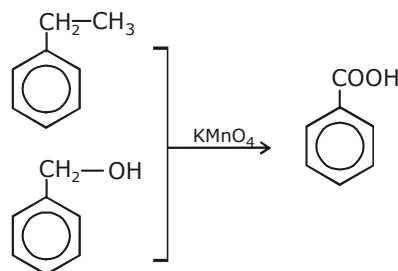
Q.9 (ABD)



Q.10 (AC)



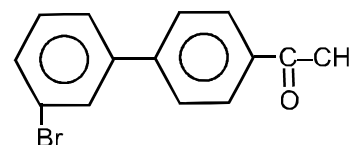
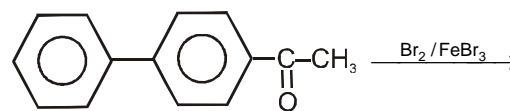
Q.11 (AB)



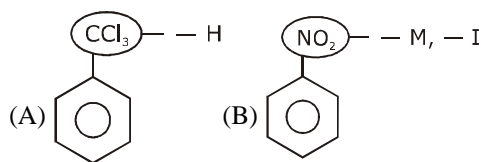
Q.12 (AC)

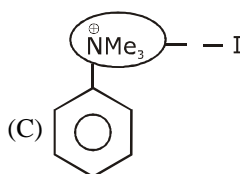
Q.13 (CD)

Q.14 (ABC)



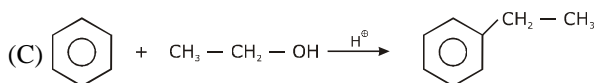
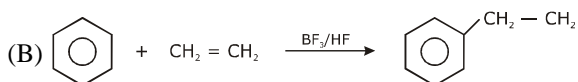
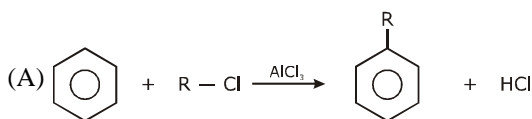
Q.15 (ABC)





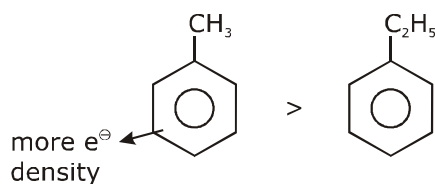
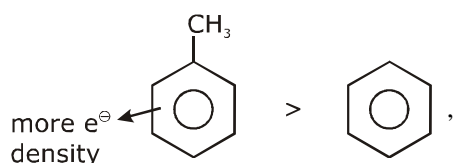
decreasing electron density in benzene ring. So attack of NO_2^+ at meta position.

Q.16 (ABC)

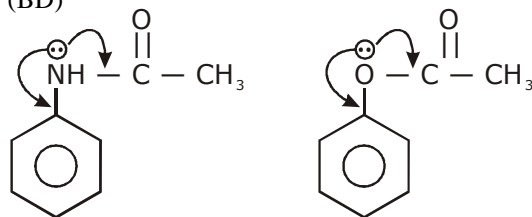


Q.17 (AB)

Reactivity order for E.S.R.

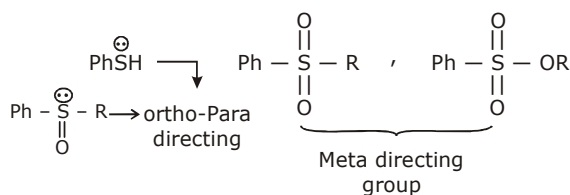


Q.18 (BD)



both are ortho-para directing group because increasing electron density at ortho/para position.

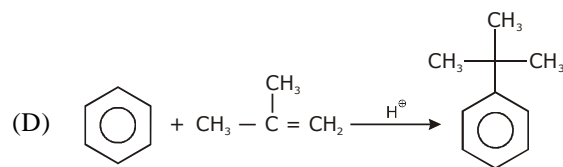
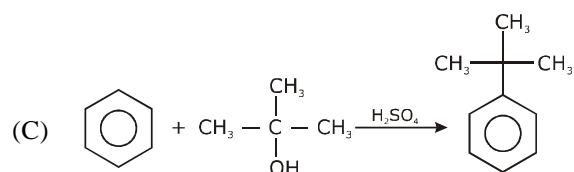
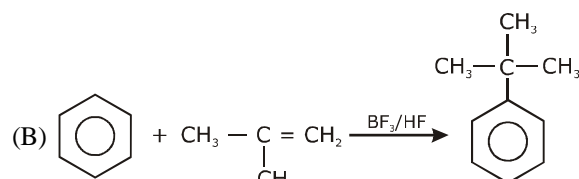
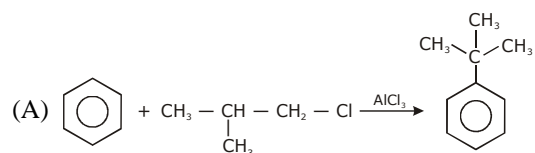
Q.19 (CD)



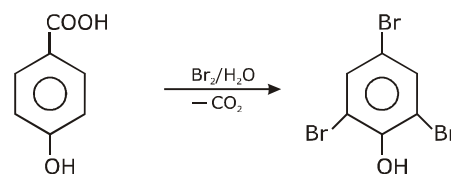
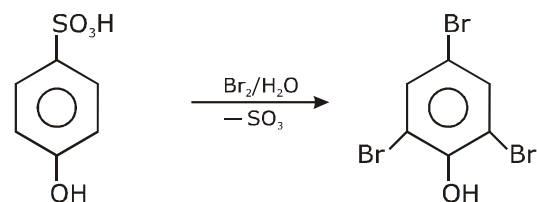
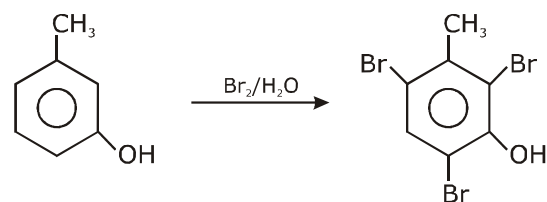
Q.20 (BC)

They are activating groups.

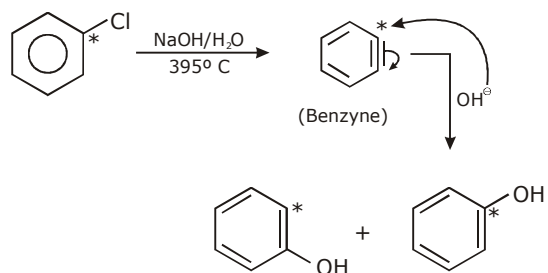
Q.21 (ABCD)



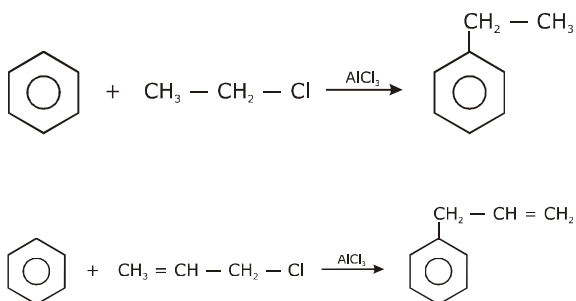
Q.22 (BCD)



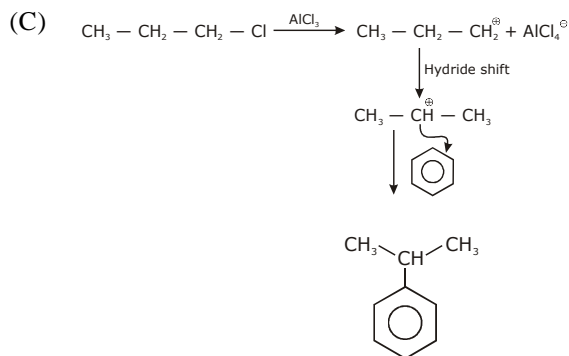
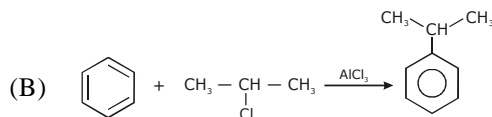
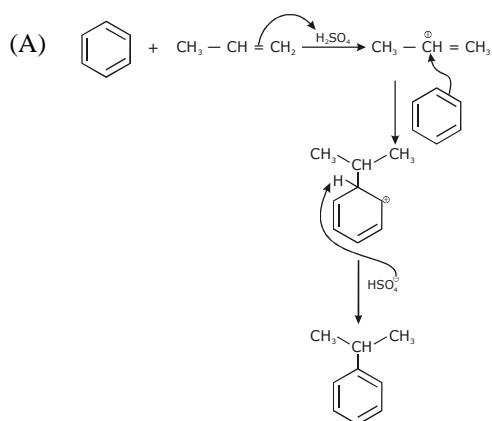
Q.23 (AB)



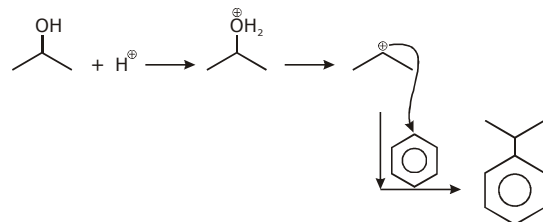
Q.24 (CD)



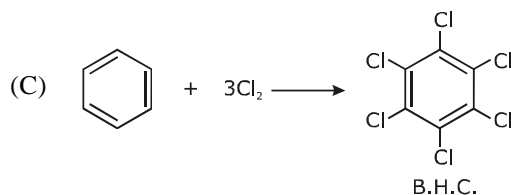
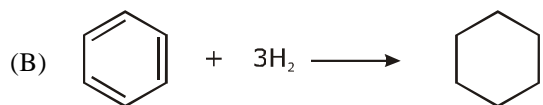
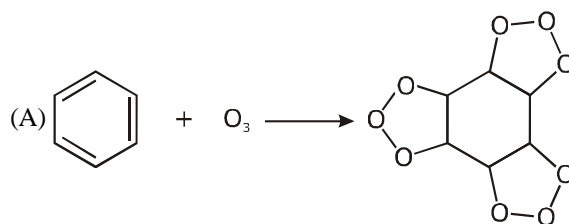
Q.25 (ABCD_)



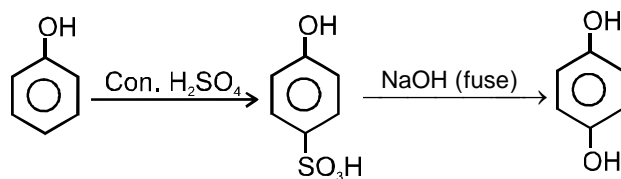
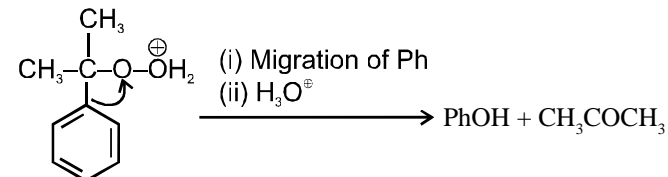
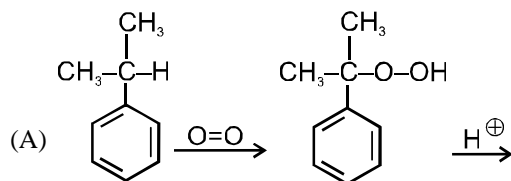
(D)

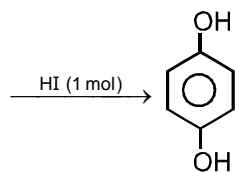
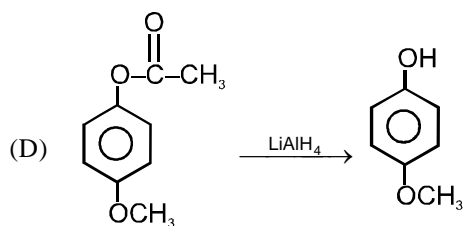
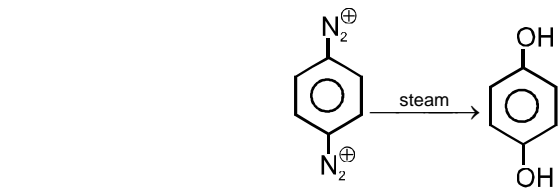
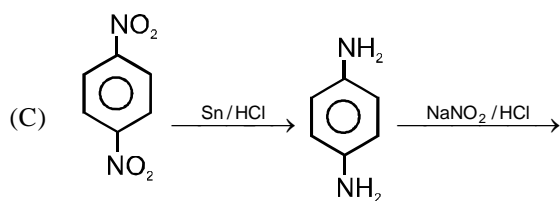
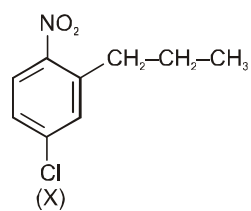
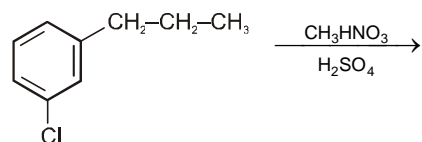
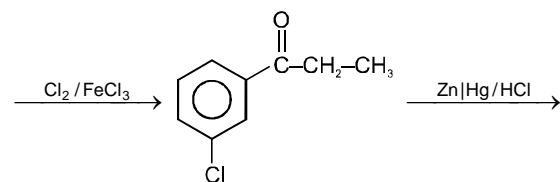
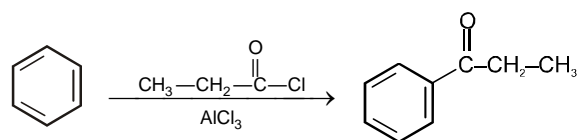
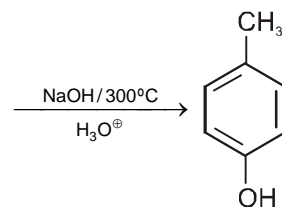
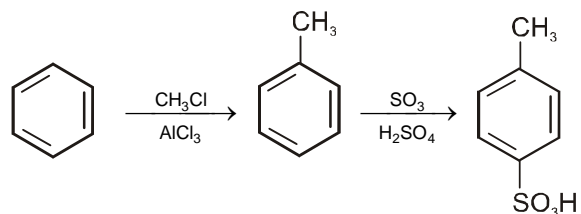
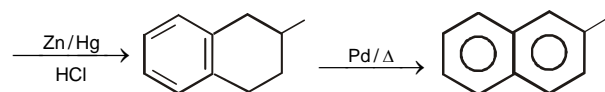
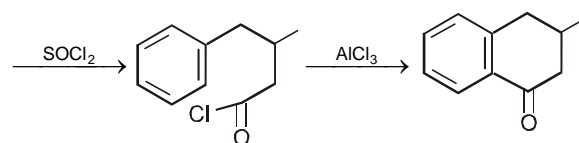
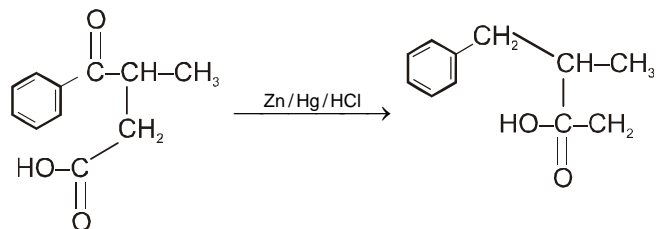
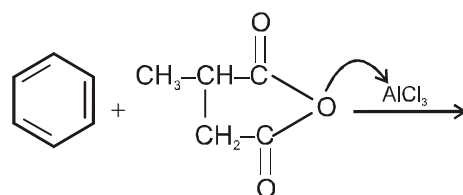


Q.26 (ABC)



Q.27 (ACD)



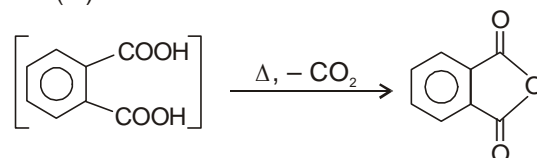
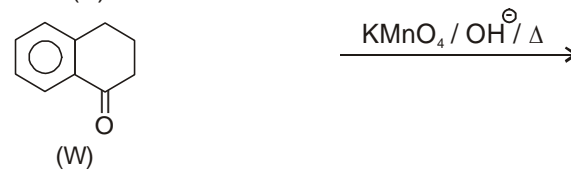
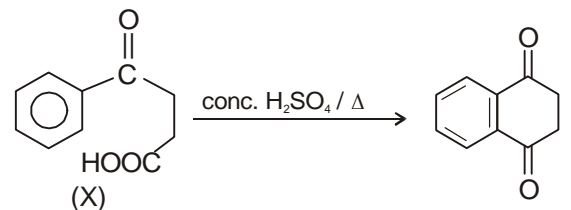
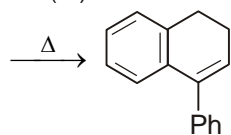
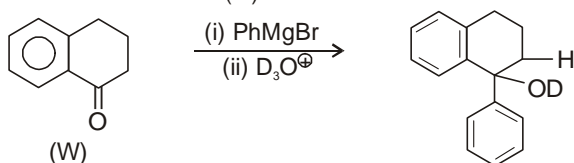
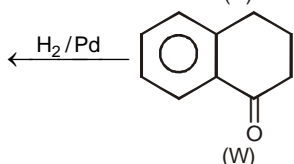
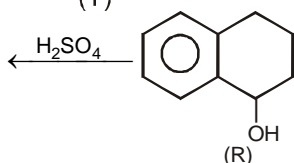
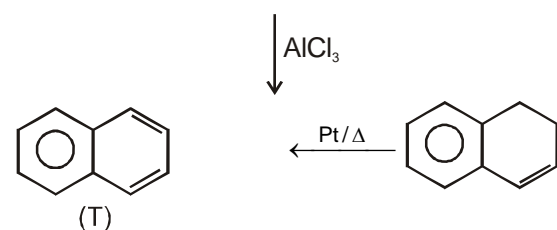
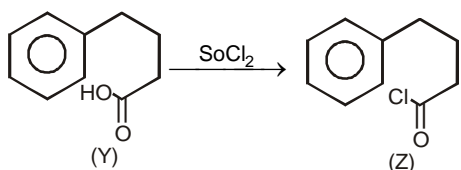
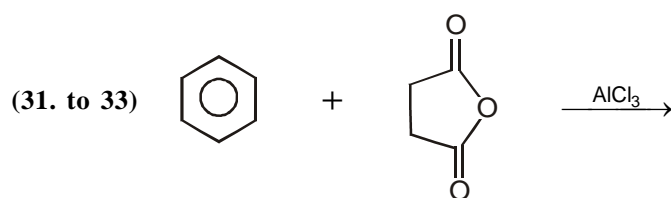

Comprehension # 1 (Q. No. 28 to 30)
Q.28 (D)

Q.29 (D)

Q.30 (D)


Comprehension (Q. No. 31 to 33)

Q.31 (C)

Q.32 (C)

Q.33 (D)



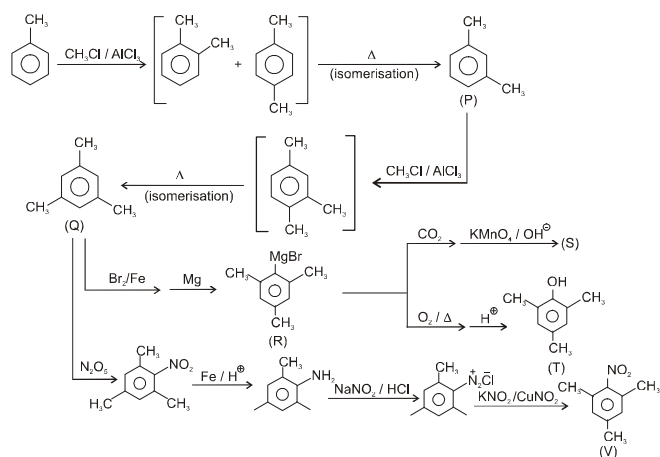
Comprehension # 3 (Q. No. 34 to 36)

Q.34 (C)

Q.35 (B)

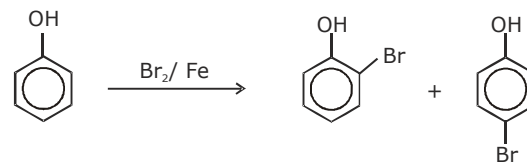
Q.36 (A)

(34 to 36)

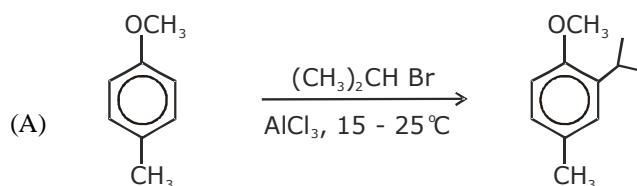


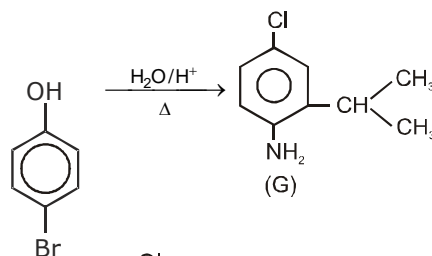
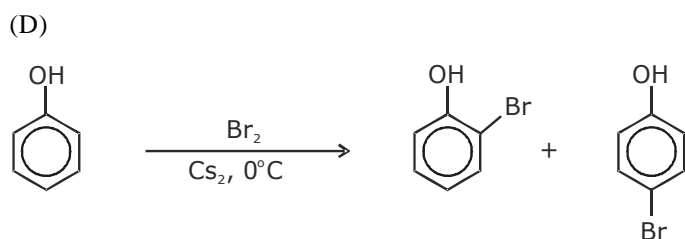
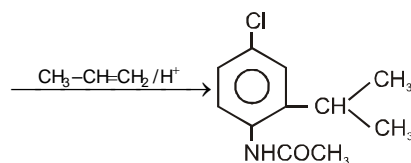
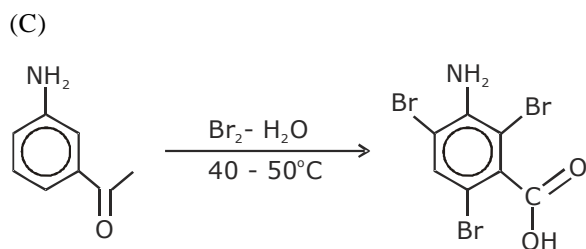
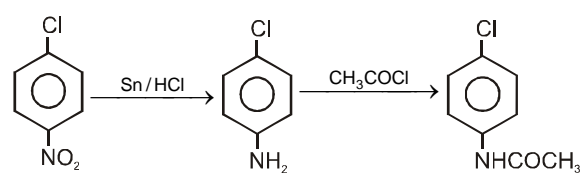
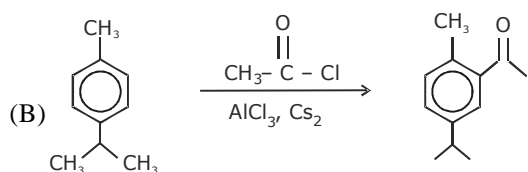
Comprehension # 4 (Q. No. 37 to 39)

Q.37 (C)

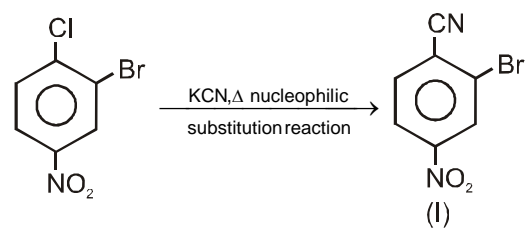
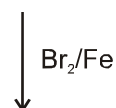
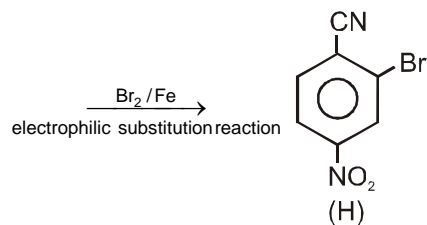
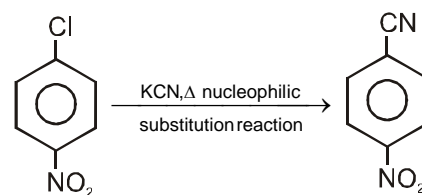
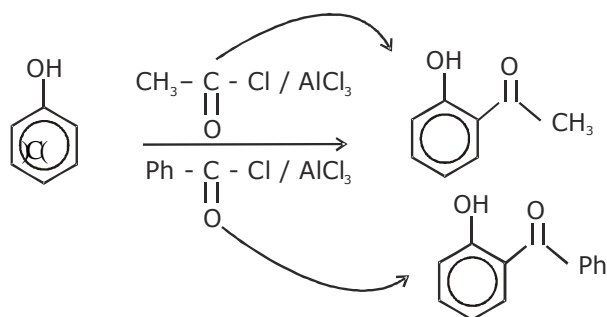


Q.38 (D)



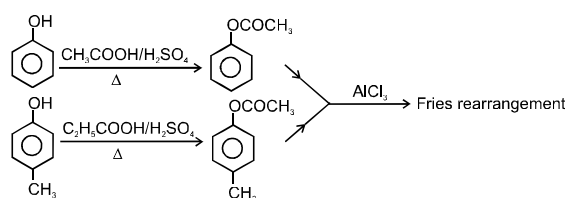


Q.39



Comprehension # 5 (Q. No. 40 to 42)

- Q.40 (C)
 Q.41 (B)
 Q.42 (C)
 (40 to 42)

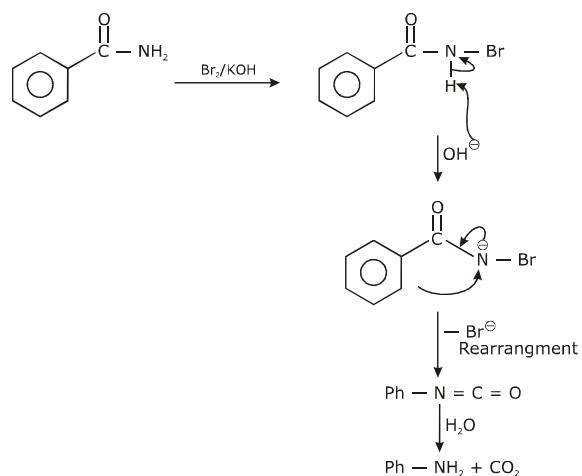
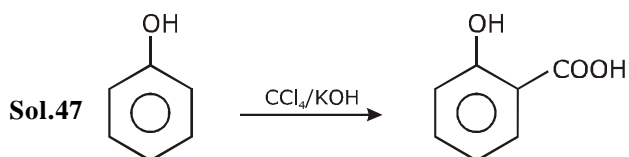
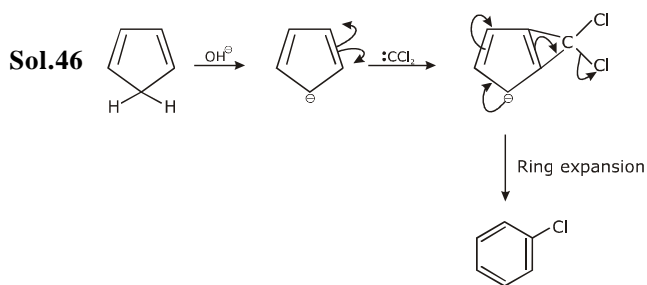


Comprehension # 6 (Q. No. 43 to 45)

- Q.43 (B)
 Q.44 (B)
 Q.45 (C)
 (43 to 45)

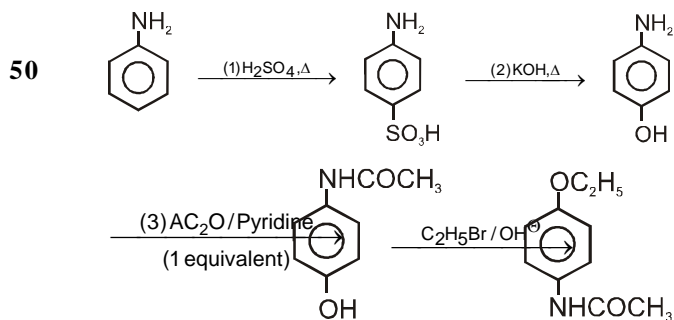
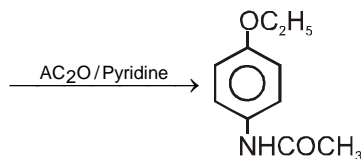
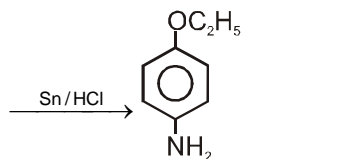
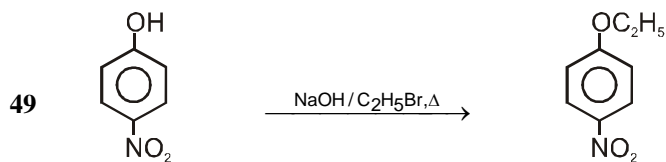
Comprehension # 7 (Q. No. 46 to 48)

- Q.46 B
 Q.47 A
 Q.48 D



Q.49 (D) **Comprehension # 8 (Q. No. 49 to 50)**

Q.50 (A)



Q.51 A **Comprehension # 9 (Q. No. 51 to 53)**

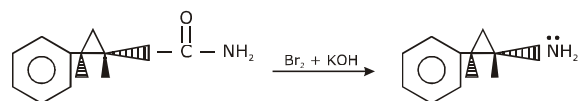
Q.52 D

Q.53 D

51

52 Secondary amide does not give Hoffmann bromamide reaction.

53



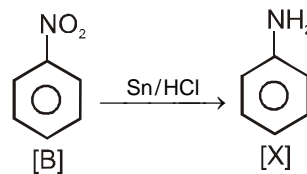
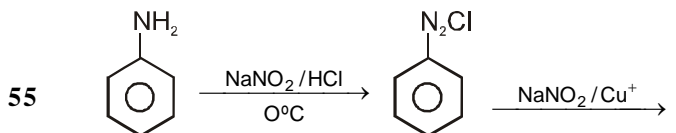
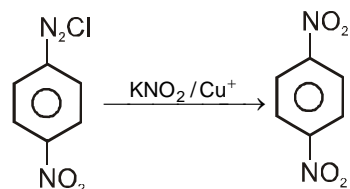
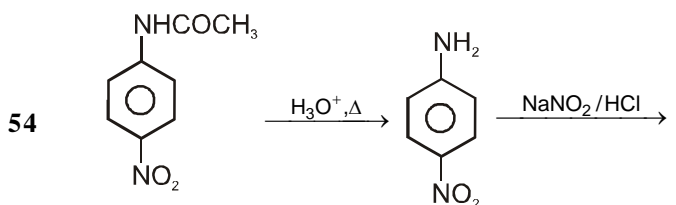
Comprehension # 10 (Q. No. 54 to 57)

Q.54 (D)

Q.55 (B)

Q.56 (D)

Q.57 (B)



56 H_2SO_4 , BF_3 , SO_3 reagent are acid and used in Beckmann rearrangement. When OH^\ominus is base.

57 Migration of alkyl group or formation of carbocation is R.D.S. step. in Beckmann rearrangement.

Q.58 **A** \longrightarrow r, s; **B** \longrightarrow r; **C** \longrightarrow q, s; **D** \longrightarrow p, s

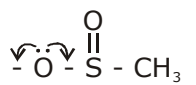
Aromatic \longrightarrow planar, cyclic, $(4n+2) \pi e^\ominus$, complete conjugation

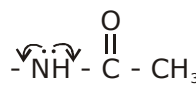
Antiaromatic \longrightarrow planar, cyclic, $(4n) \pi e^\ominus$, complete conjugation

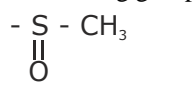
Non aromatic- cyclic structure with non-planar geometry with any hybridization

Q.59 (A) - PR, (B) - PR, (C) - PR, (D) - PS

(A) $-\text{CH}_2-\text{CH}_3$ Ortho - Para directing and Activating group.

(B)  Ortho - Para directing group or activating group

(C)  Ortho - Para directing group or activating group

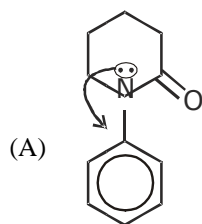
(D)  Ortho - Para directing or deactivating group.

Q.60 (A) \longrightarrow q, r; (B) \longrightarrow q, s; (C) \longrightarrow p, r; (D) \longrightarrow q, s
 (A) $-\text{CH}=\text{CHCOOH}$ is deactivating due to $-I$ of $-\text{COOH}$ group, but o,p-directing due to stability of carbocation.

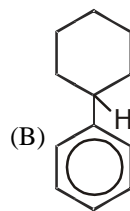
(B) $-\text{CCl}_3$ is electron withdrawing group due to $-I$ nature.

(C) $-\text{OH}$ is electron donating due to $+m$; $-\text{NO}_2$ is electron withdrawing due to $-m$.

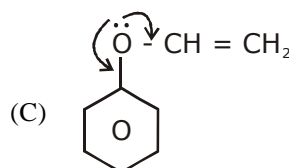
Q.61 (A) - PR; (B) - PR; (C) - P,R; (D) - P,R



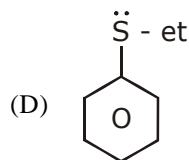
Ortho / para director, Activating group



Ortho / para director, Activating group

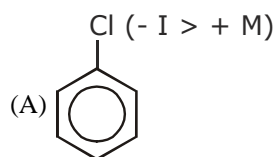


Ortho / para director, Activating group

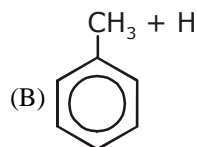


Ortho / para director, Activating group

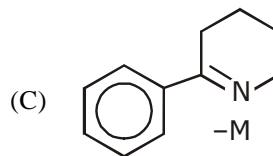
Q.62 (A) - P, R, S; (B) - R; (C) - Q, S; (D) - Q, R, S



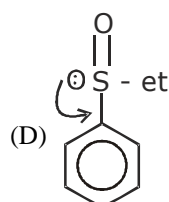
Ortho / para director, deactivating group



Ortho / para director, activating group



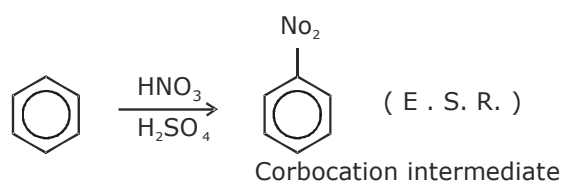
Meta director, deactivating group



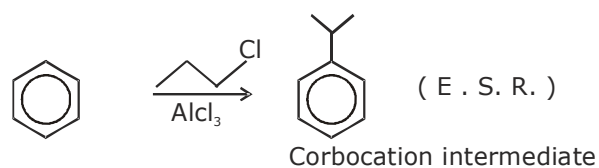
Ortho-para director, deactivating group

Q.63 (A)–PR, (B)–PRS, (C)–QR, (D)–PR

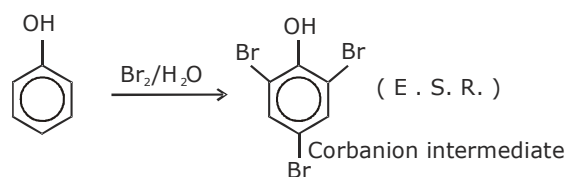
(A)



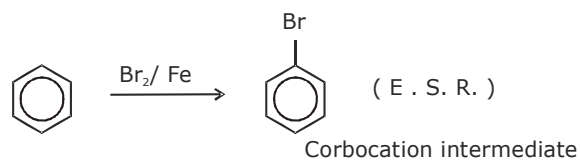
(B)



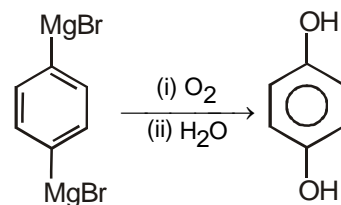
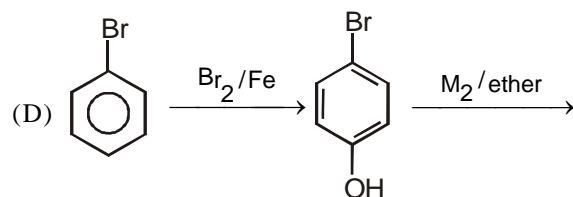
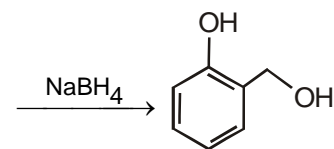
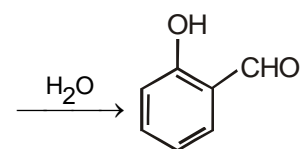
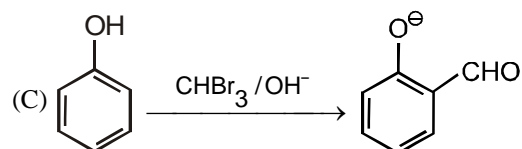
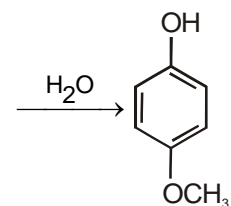
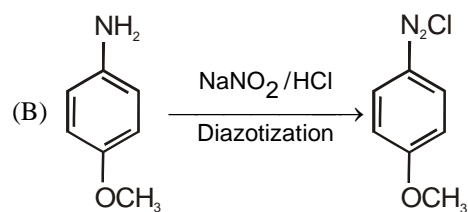
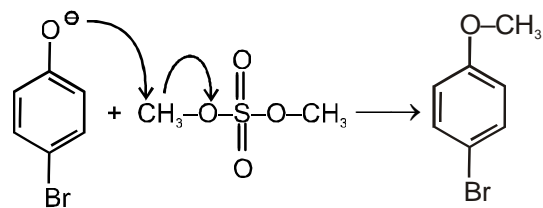
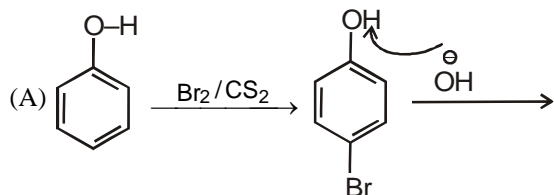
(C)



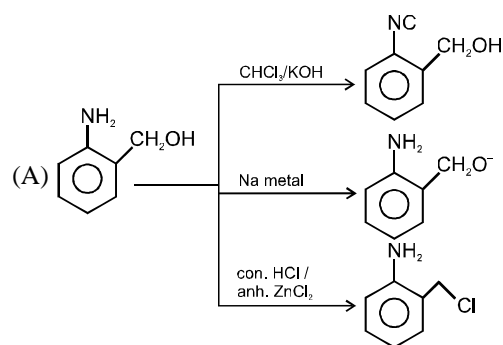
(D)

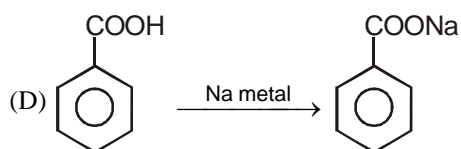
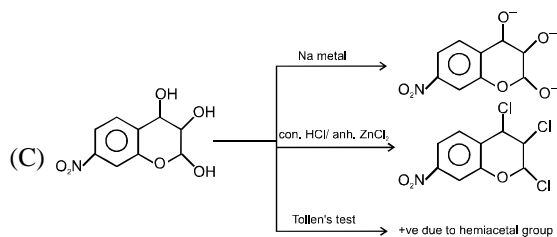
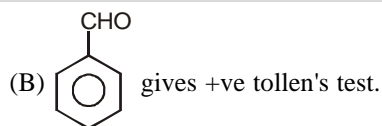


Q.64 (A) → s, (B) → q, (C) → p, (D) → r

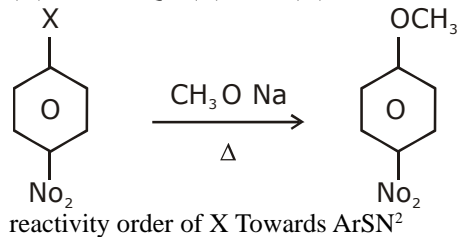


Q.65 (A) – p,q,r ; (B) – s ; (C) – q,r,s ; (D) q

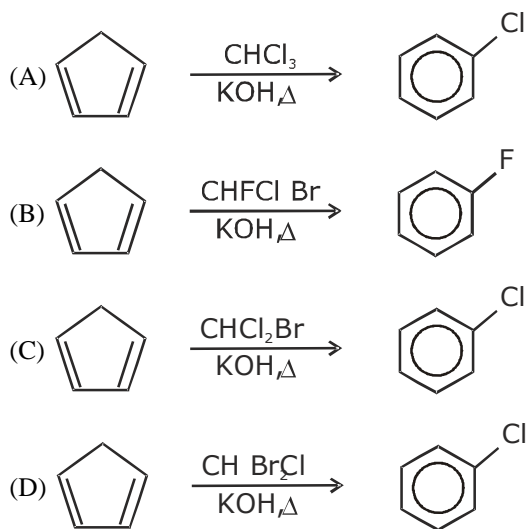




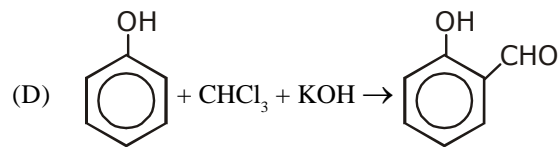
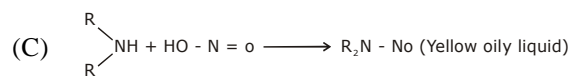
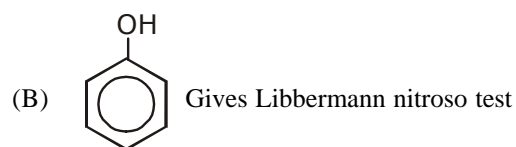
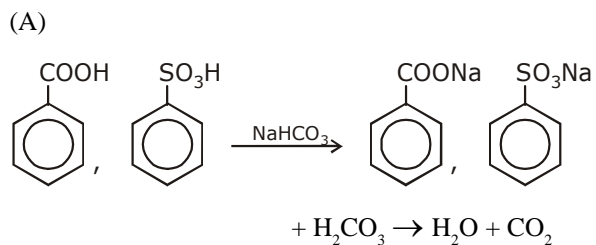
Q.66 (A) - P ; B - Q ; (C) - R ; (D) - S



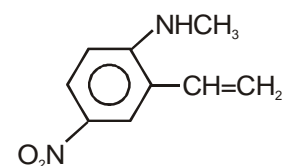
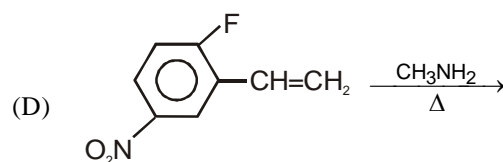
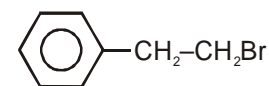
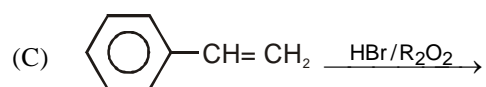
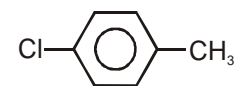
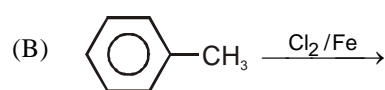
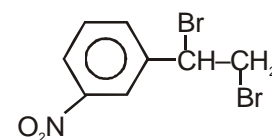
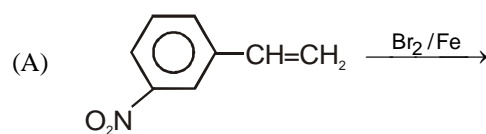
Q.67 (A) - Q ; (B) - P ; (C) - Q ; (D) - Q



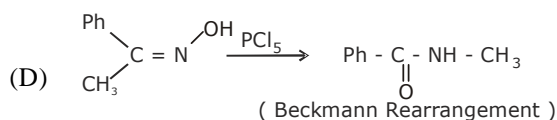
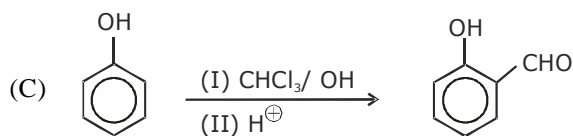
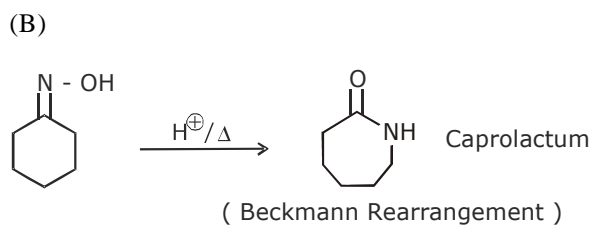
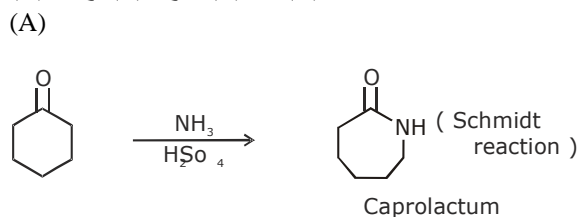
Q.68 (A) - Q,S ; (B) - P,R ; (C) - R ; (D) - P



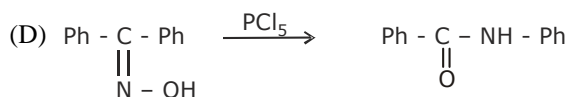
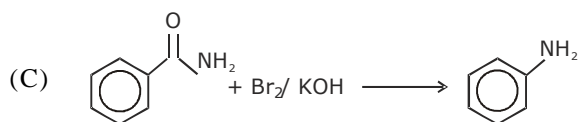
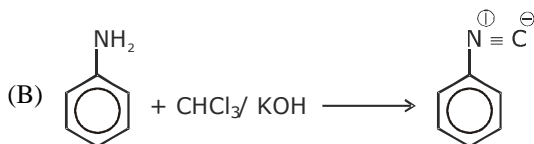
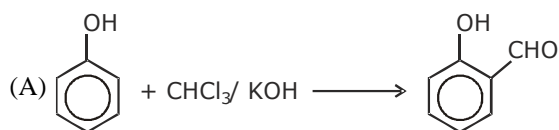
Q.69 (A) - q ; (B) - p ; (C) - s ; (D) - r.



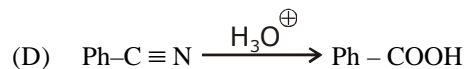
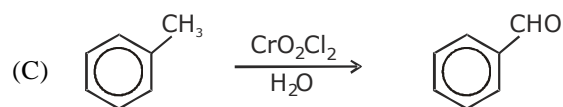
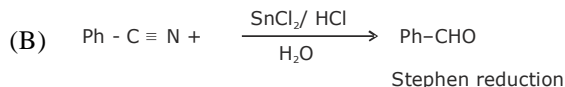
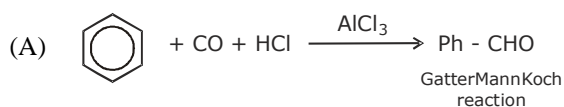
Q.70 (A)–PQ, (B)–QS, (C)–P, (D)–R



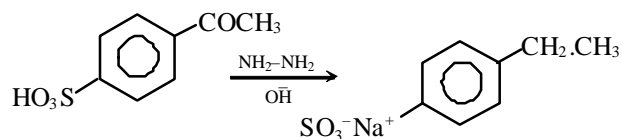
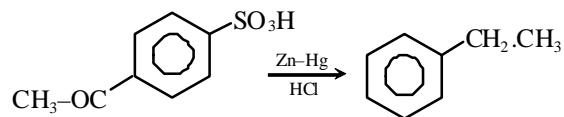
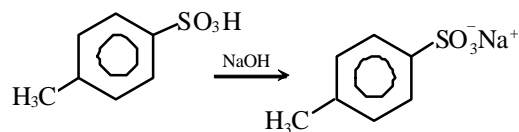
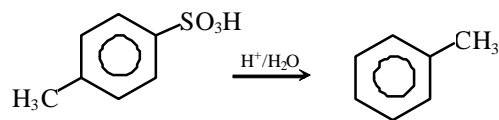
Q.71 (A) - P ; (B) - P; (C) - Q; (D) - R, S



Q.72 (A) - P S; (B) - P, R; (C) - P, Q; (D) - T



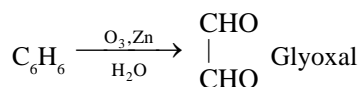
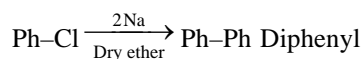
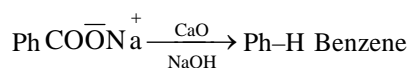
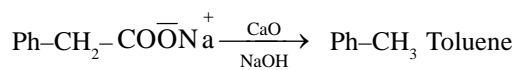
Q.73 A \rightarrow S; B \rightarrow Q; C \rightarrow P; D \rightarrow R

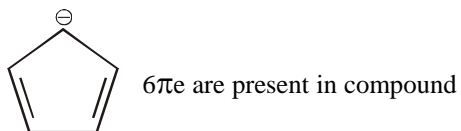
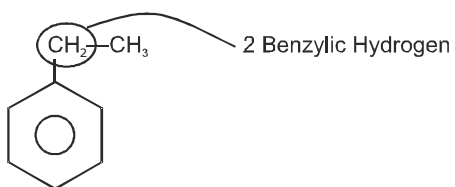
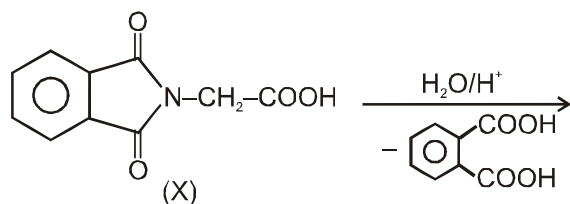
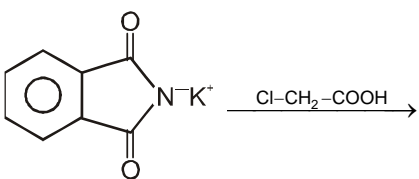


Q.74 A \rightarrow P,R; B \rightarrow Q,R; C \rightarrow P,R; D \rightarrow Q,S

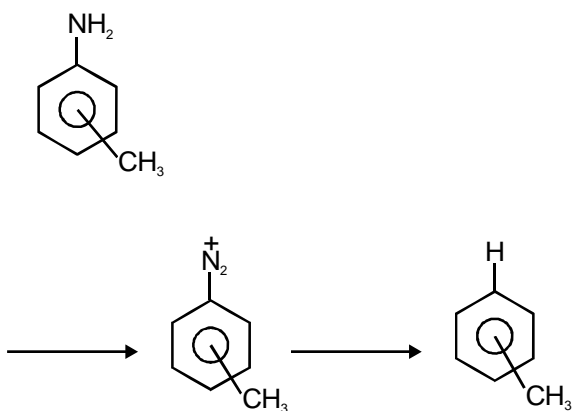
- $\text{CH}_3 \longrightarrow$ o, p activating group
- $\text{OH} \longrightarrow$ o, p activating group
- $\text{Cl} \longrightarrow$ o, p deactivating group
- $\text{NO}_2 \longrightarrow$ m, deactivating

Q.75 A \rightarrow Q; B \rightarrow P; C \rightarrow S; D \rightarrow R

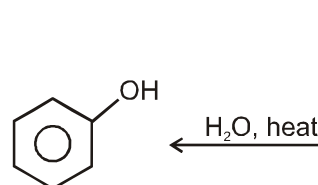
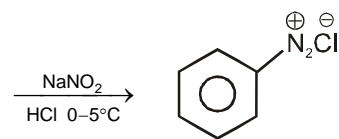
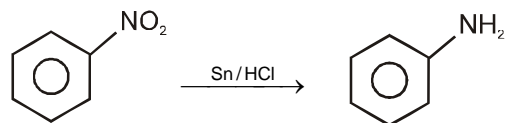


NUMERICAL VALUE BASED
Q.1 [6]

Q.2 [2]

Q.3 [75]


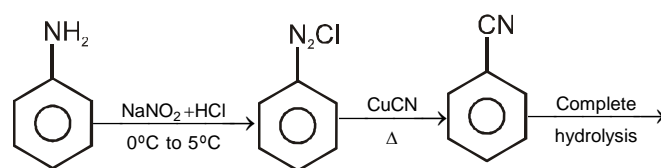
$\text{NH}_2\text{-CH}_2\text{-COOH}$ (Y)
Molecular weight of Y = 75

Q.4 [3]


o, *m*, *p* isomer of toluidines will give toluene with NaNO_2/HCl followed by H_3PO_2 treatment.

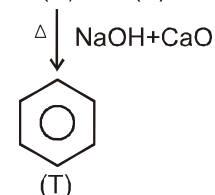
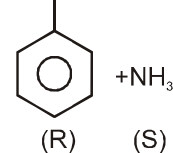
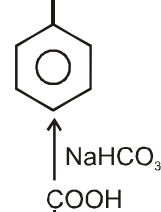
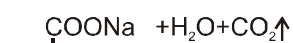
Q.5 [94]


molecular weight of Z = 94

Q.6


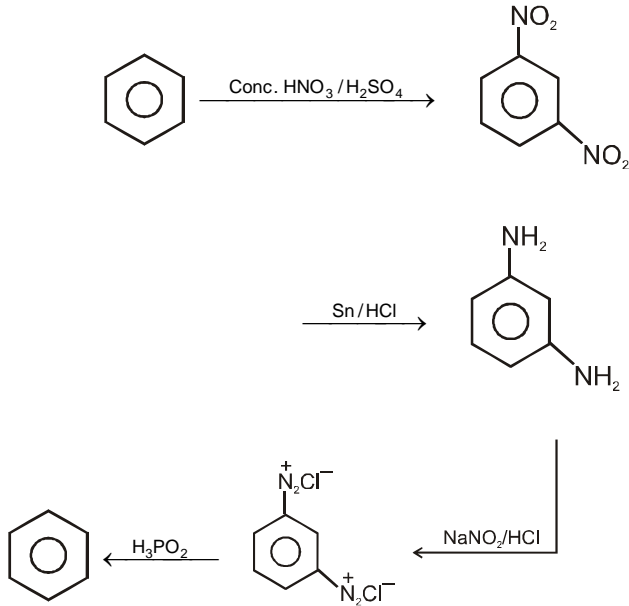
(P)

(Q)

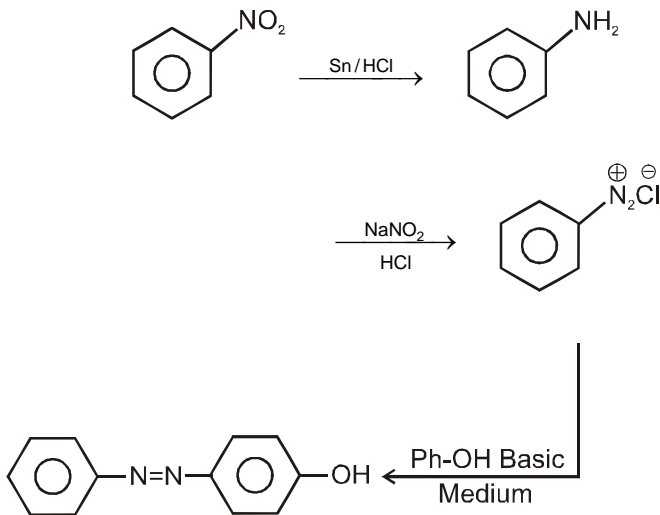


Molecular weight = $12 \times 6 + 6 = 78$

Q.7 [0].



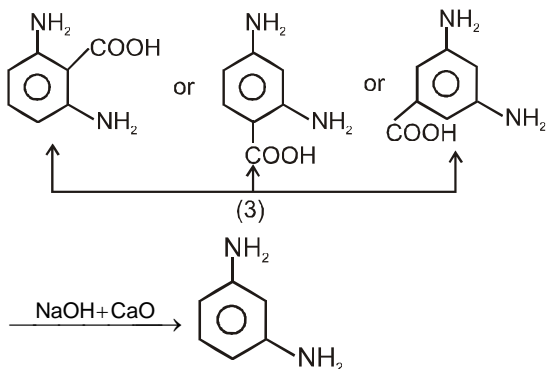
Q.8 [99]



molecular weight = 198

$$\frac{198}{2} = 99$$

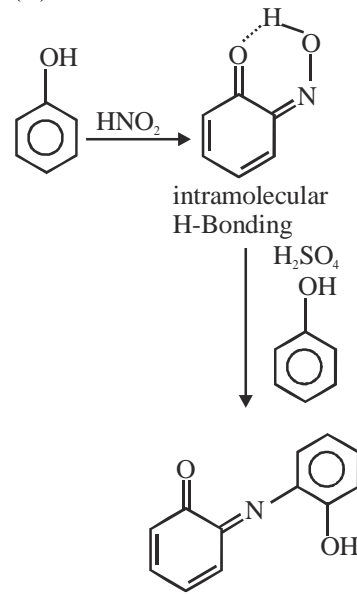
Q.9 [3]



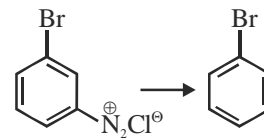
KVPY

PREVIOUS YEAR'S

Q.1 (C)

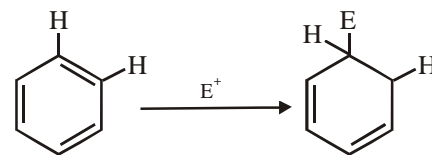


Q.2 (B)

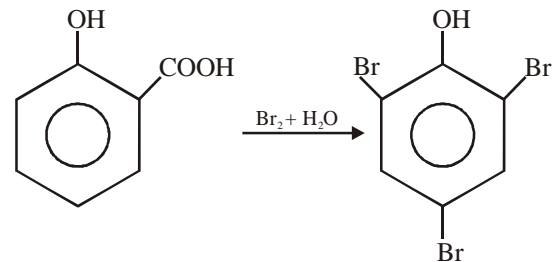


H_3PO_2 As a reagent used because other are strong reducing agent

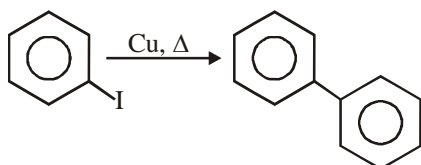
Q.3 (4)



Q.4 (C)

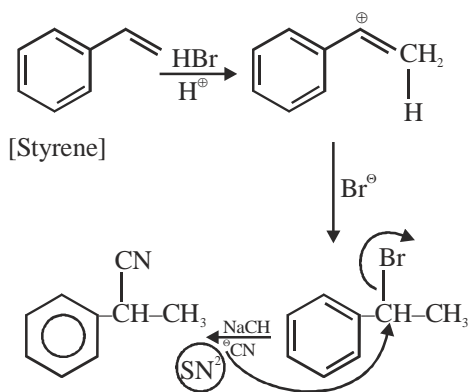


Q.5 (A)

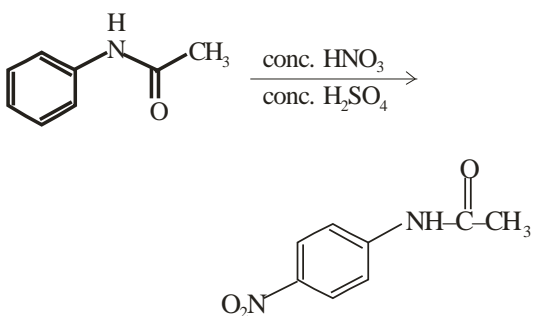


This is example of Ulman reaction which gives product like Wurtz reaction.

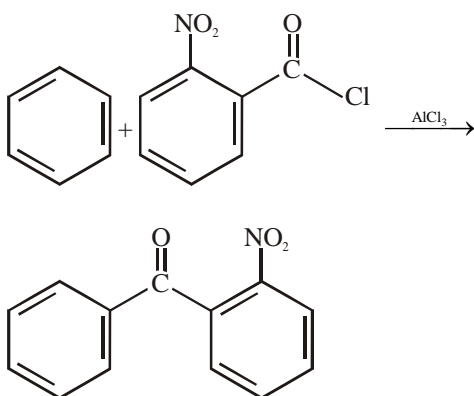
Q.6(B)



Q.7 (A)

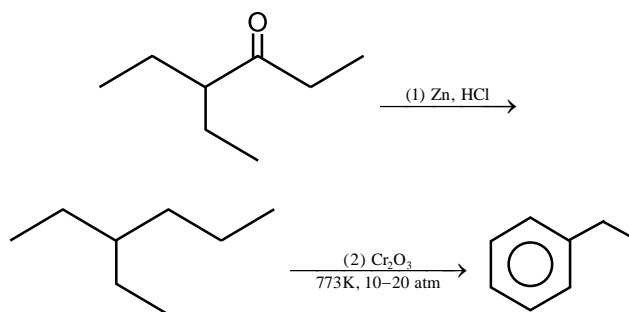


Q.8 (A)



JEE-MAINS PREVIOUS YEAR'S

Q.1 (2)



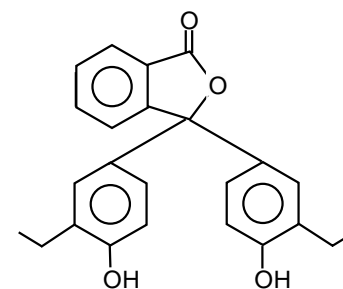
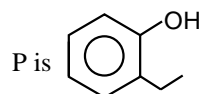
In first step ketonic group is reduced by Clemmensen reduction, in second step aromatisation takes place.

Q.2 (2)

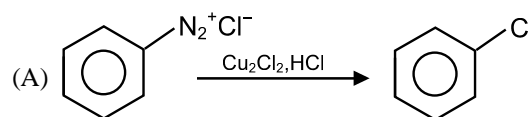
Q.3 (4)

Q.4 (D)

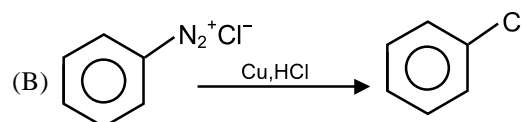
Q.5 (1)



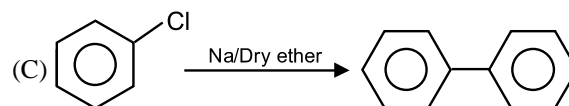
Q.6 (2)



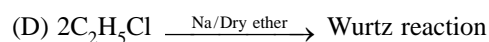
Sandmeyer reaction



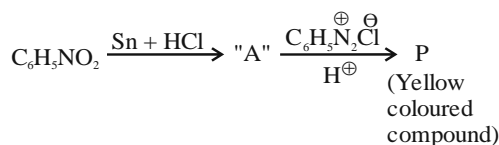
Gattermann reaction



Fittig reaction



Q.7 (1)



Q.8 (4)

Q.9 (1)

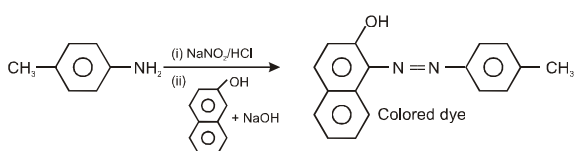
Q.10 (2)

Q.11 (1)

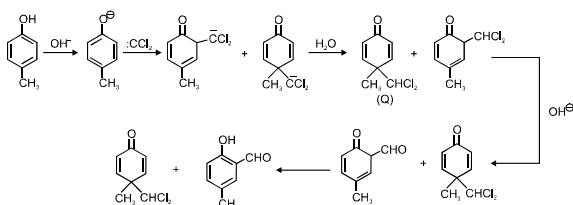
**JEE-ADVANCED
PREVIOUS YEAR'S**

Q.1 Ans.

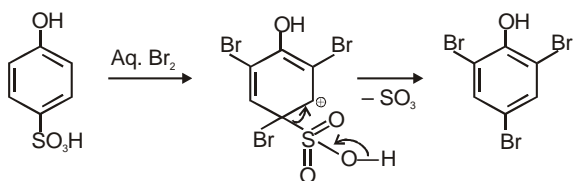
(C)

Q.2 (C) R (minor)
(B,D)

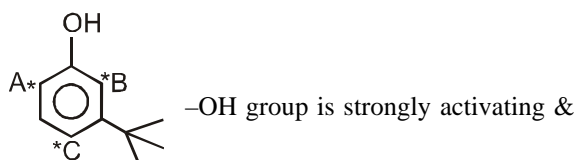
(D) S (major)



Q.3 (B)



Q.4 (A, B, C)



O, P-directing due to its powerful +M effect. With I_2 only A is substituted, since $-\text{I}$ is large, steric inhibition by large $-\text{CMe}_3$ group forbids substitution at B or C. $-\text{Br}$ and $-\text{Cl}$ become progressively more reactive, due to –

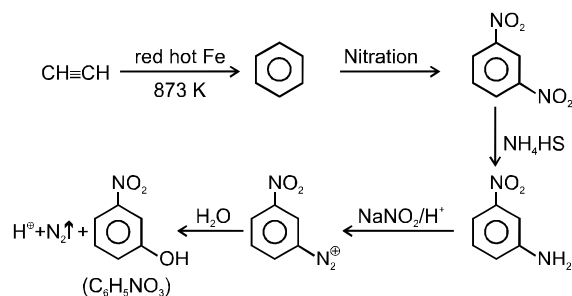
(a) increasing electrophilic nature of X^\oplus (not mentioned is any option).(b) Smaller size most sterically hindered location is B which is substituted only by $-\text{Cl}$.

Q.5 (D)

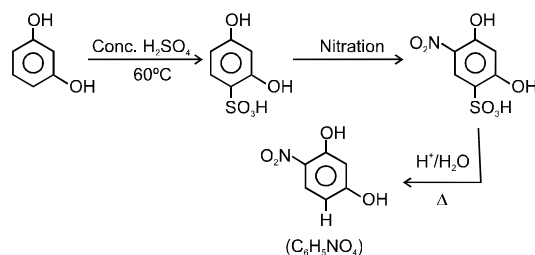
In dye test, phenolic $-\text{OH}$ is converted to $-\text{O}^\ominus$, which activates the ring towards EAS. This is possible only in alkaline solution. Hence (D).

Q.6 (C)

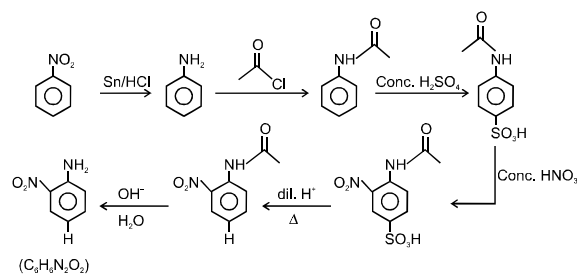
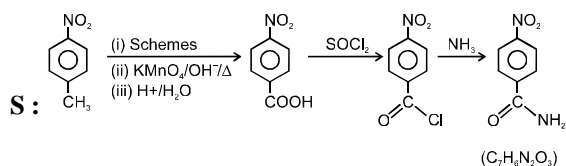
P:

 $\therefore \text{P} \rightarrow 3$

Q:

 $\therefore \text{Q} \rightarrow 4$

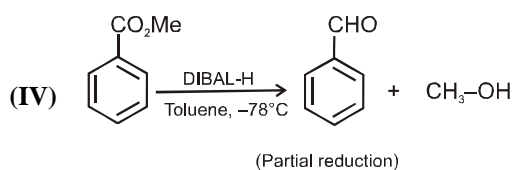
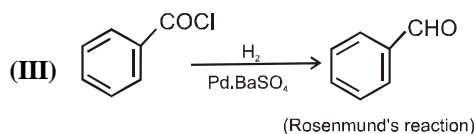
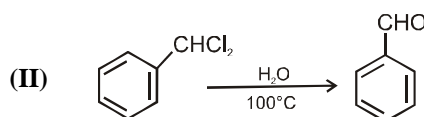
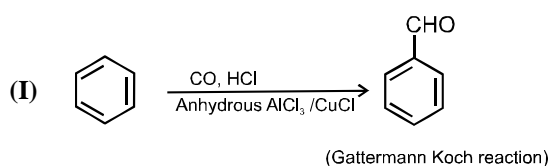
R:

 $\therefore \text{R} \rightarrow 2$  $\therefore \text{S} \rightarrow 1$

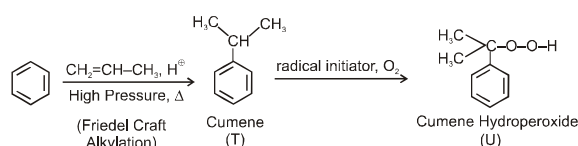
Hence the answer is (C)

Note : Verifying any two can easily give you the answer complete details are given for reference & understanding.

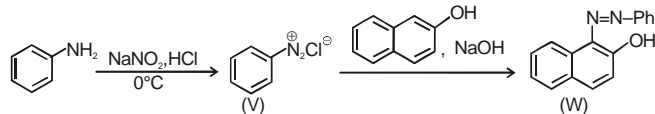
Q.7 [4]



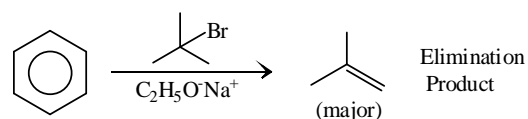
Q.8 (B)



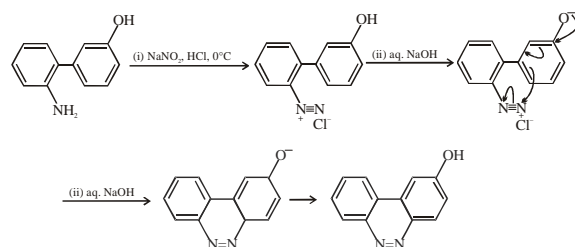
Q.9 (A)



Q.10 (BCD)

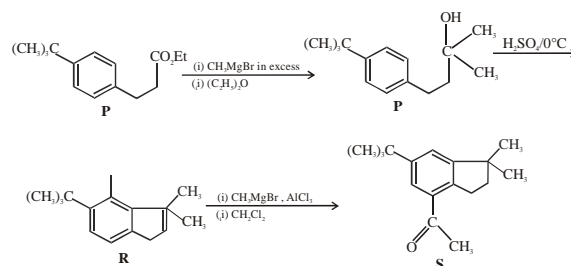


Q.11 (A)



Comprehension # 2 (Q. No. 12 to 13)

Q.12 (B)

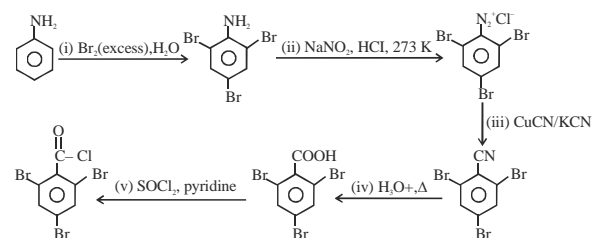


Q.13 (B)

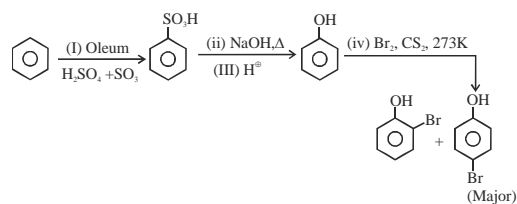
Process involved in Q → R reaction is alkylation.
Process involved in R → S reaction is alkylation.

Q.14 (4.00)

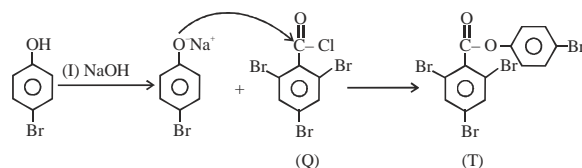
Scheme 1 :



Scheme 2 :

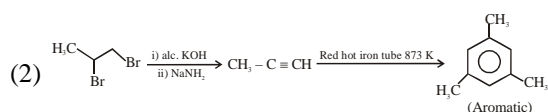
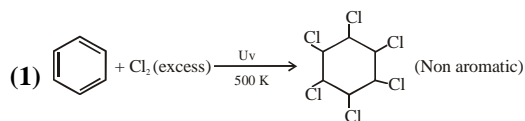


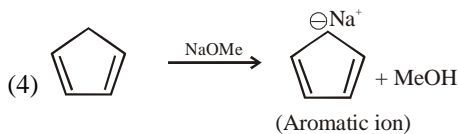
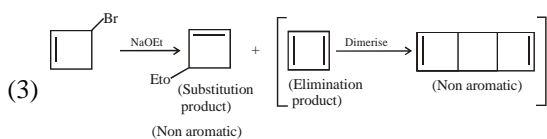
Scheme 3 :



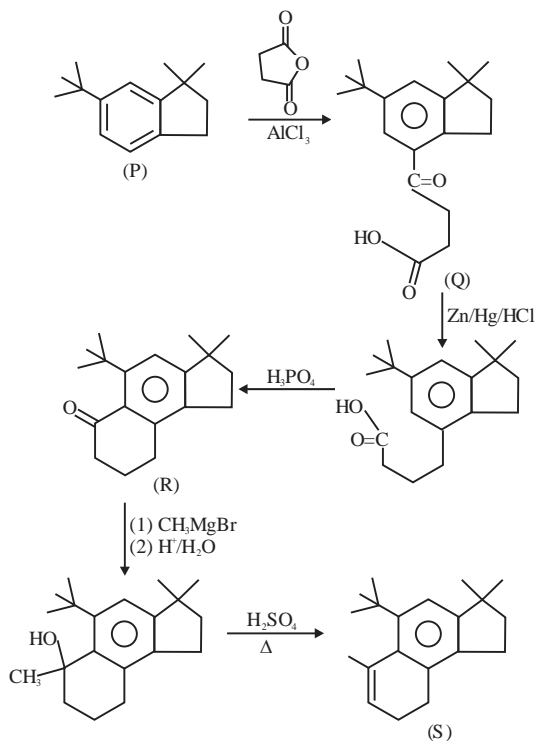
Ans. (2,4)

Sol.

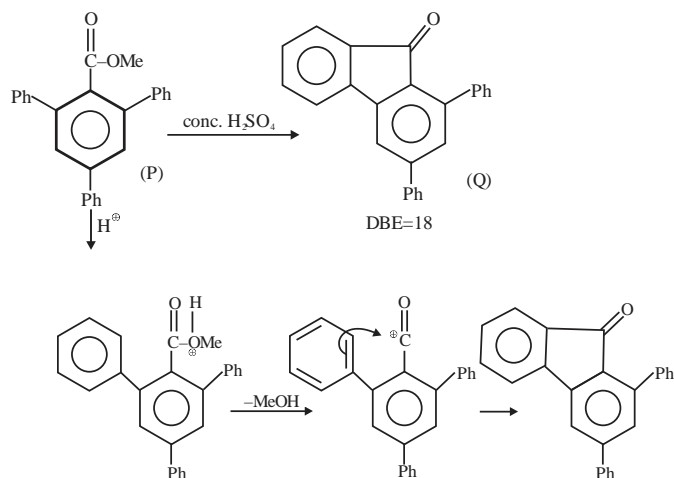




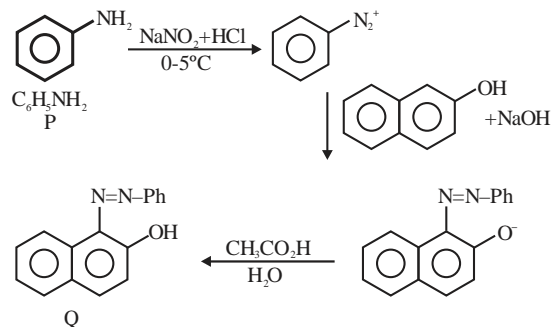
Ans. (B,D)



Q.17 [18]



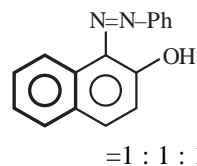
Q.18 [18.60]



Molecular weight of
aniline = M.wt. of C_6NH_7
= $72 + 7 + 14 = 93$
density of P = 1 gm ml^{-1}
 $9.3 \text{ ml of P} = 9.3 \text{ gm P}$

$$= \frac{9.3}{93} = 0.1 \text{ mole P}$$

The mole ratio $\text{PhNH}_2 : \text{PhN}_2^+ :$



$$= 1 : 1 : 1$$

so the mole of Q formed will be 0.1 mole and extent of reaction is 100% but if it is 75% yield.

$$\text{Then amount of Q} = 0.1 \times \frac{75}{100} = 0.075 \text{ mol}$$

The molecular formula of Q = $C_{16}H_{12}ON_2$
so M.wt. of Q = $16 \times 12 + 12 \times 1 + 16 + 2 \times 14$
= $192 + 12 + 16 + 28$
= 248 gm

$$\text{so amount of Q} = 248 \times 0.075$$

$$= 18.6 \text{ gm}$$

Carboxylic Acids and It's Derivatives and Nitrogen Containing Compounds(Amines)

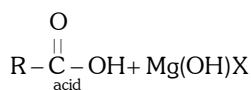
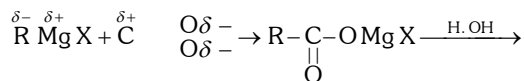
EXERCISES

ELEMENTARY

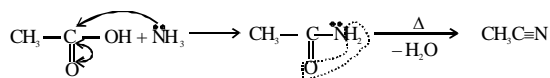
Preparation of carboxylic acid and their derivative

Q.1 (3)

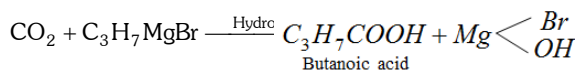
Formic acid can not be prepared by grignard's reagent.
Higher acids are prepared by the reaction of CO_2 on grignard's reagent



Q.2 (4)

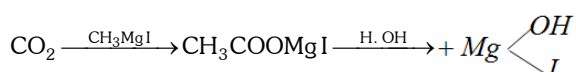


Q.3 (1)



Q.4 (2)

CO_2 adds to Grignard's reagent to yield acids.



Q.5 (4)

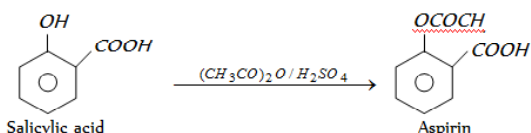
Acidity decreases with the decrease in electronegativity of halogen *i.e.*,



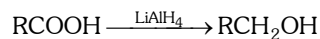
Q.6 (1)

Q.7 (2)

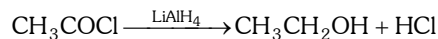
Q.8 (2)



Q.9 (4)



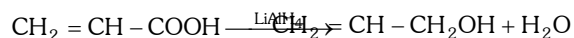
Q.10 (2)



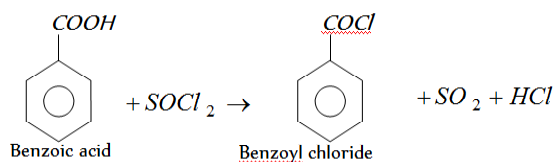
Q.11 (1)

In this reaction $\alpha\text{-H}$ is replaced by chlorine

Q.12 (2)

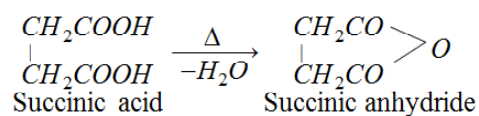


Q.13 (3)



Q.14 (1)

When succinic acid is heated it forms. Succinic anhydride

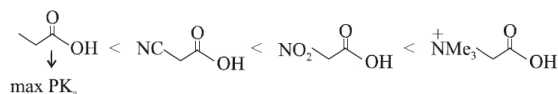


Q.15 (4)

Amide group represent by the formula $-\text{CONH}_2$

Q.16 (1)

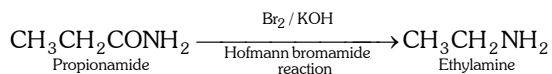
$\text{pK}_a \uparrow$ least acidic, acidic strength



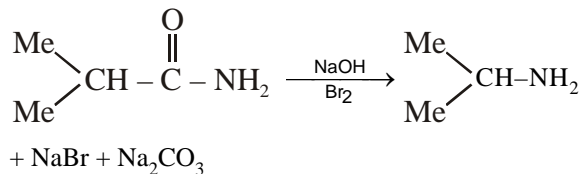
Q.17 (4)

CHF_2-COOH . Difluoroacetic acid is strongest because presence of two F atoms increases its acidic nature.

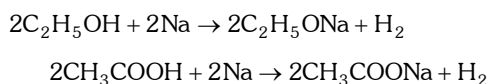
Q.18 (4)



Q.19 (1)



Q.20 (3)



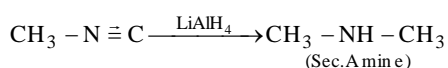
Q.21 (1)

It is picric acid because it has three $-\text{NO}_2$ group are arranged which are ortho and para position

Q.22 (2)

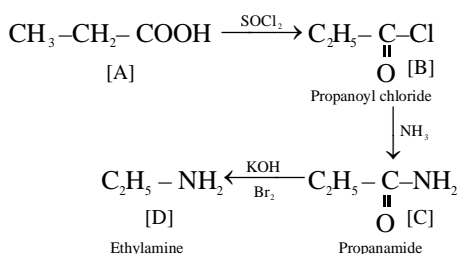
$-\text{COOH}$ and $-\text{OH}$ group form the hydrogen bond by which they have high boiling point. $-\text{COOH}$ group show strong hydrogen bonding so it form dimer and have more boiling point than $-\text{OH}$ group. While $-\text{CHO}$ group do not form hydrogen bond. Thus the reactivity order are as $3 > 1 > 2$.

Q.23 (3)



Isocyanide on reduction gives secondary amine.

Q.24 (4)



Q.25 (3)

Q.26 (2)

This reaction is used for preparation of primary aliphatic amines.

Q.27 (2)

Q.28 (3)

Test G **Group**

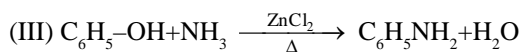
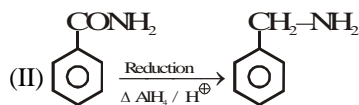
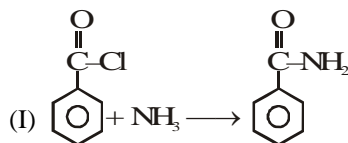
(I) Iodoform test (I) $\text{CH}_3 - \text{C}(=\text{O}) - \text{CH}_3$ & $\text{CH}_3 - \text{CH}(\text{OH}) - \text{CH}_3$

(II) Victor mayer test 1°, 2° & 3° alcohol

(III) Carbyl amine test Primary amine

(IV) Libermann's reaction Phenolic compound

Q.29 (3)



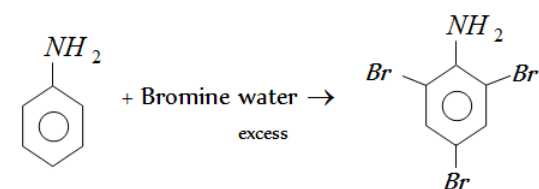
Q.30 (4)

Tertiary amine does not react with nitrous acid because in it α -H atom is absent.

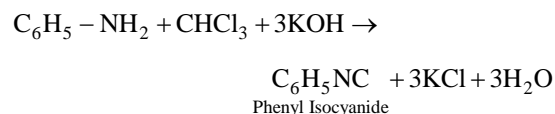
Q.31 (3)

Hinsberg Test

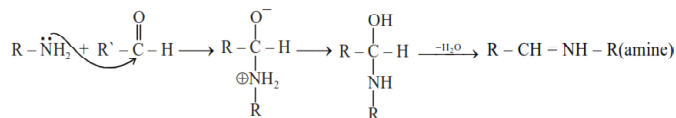
Q.32 (4)



Q.33 (1)

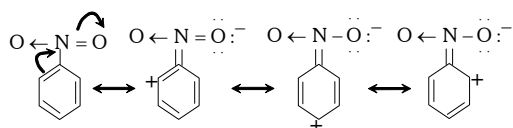


Q.34 (2)



Q.35 (2)

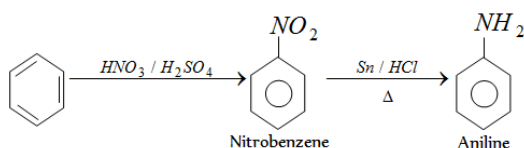
Q.36 (2)



Presence of $-\text{NO}_2$ group decreases electron density at o - and p - positions. Hence, incoming electrophile goes to m position. Therefore it is m -directing group.

Q.37 (2)

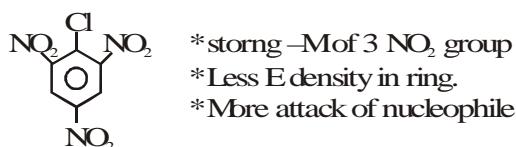
Carboxylic Acid and Its Derivatives Amines (Nitrogen Containing Compounds)



Q.38 (2)

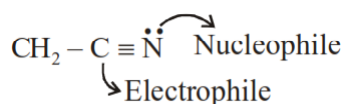
Q.39 (1)

$$\text{NSR [Aryl halide]} \propto \frac{-M}{+M}$$

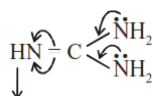


Q.40 (1)

Q.41 (1)

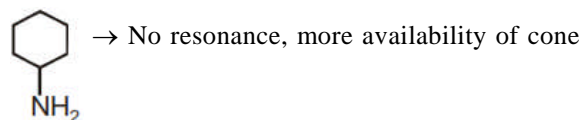


Q.42 (1)



Electron - density will be maximum at this position.

Q.43 (3)

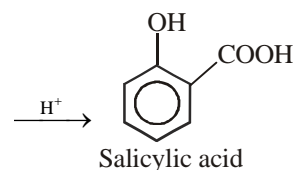
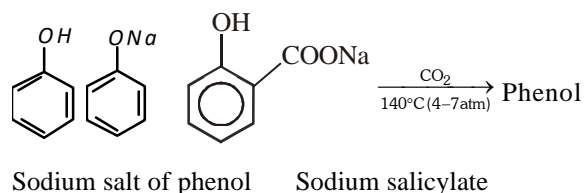


- pair.

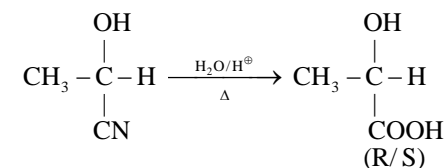
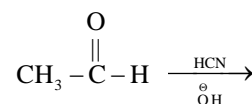
JEE-MAIN
OBJECTIVE QUESTIONS

Q.1 (D)

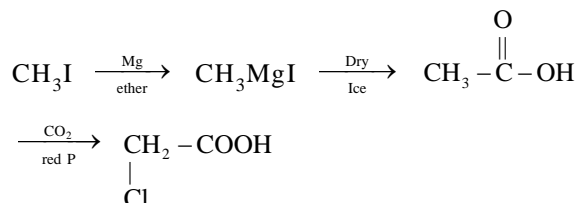
Treatment of sodium salt of phenol with CO_2 under pressure bring about substitution of the carbonyl group $-\text{COOH}$, for the hydrogen of the ring. This is called as Kolbe's reaction



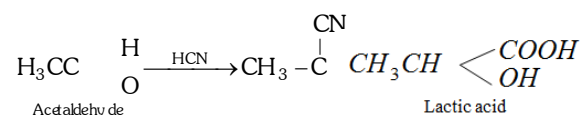
Q.2 (3)



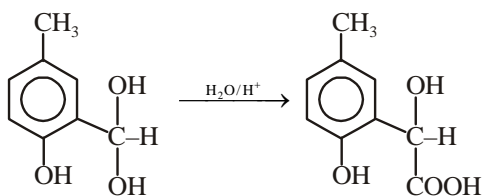
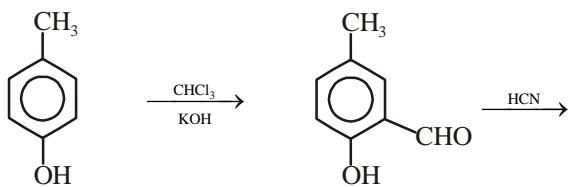
Q.3 (4)



Q.4 (3)



Q.5 (4)

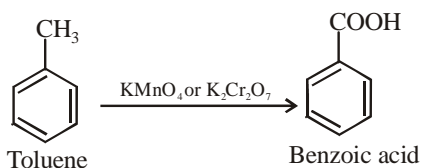


Q.6 (1)



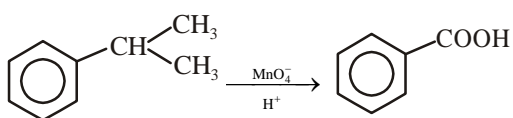
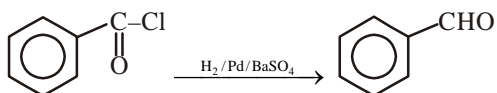
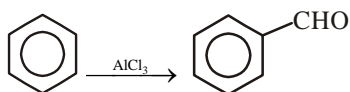
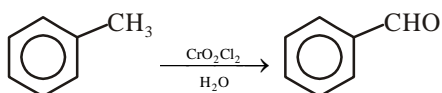
decarboxylation

Q.7 (4)

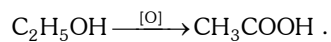


Q.8 (1)

Q.9 (4)



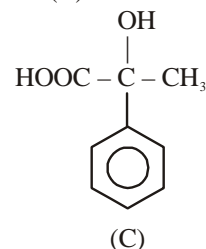
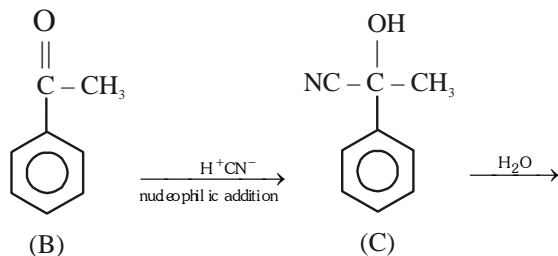
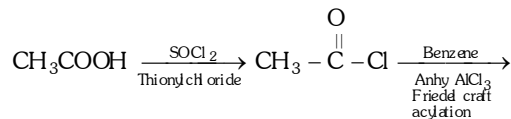
Q.10 (1)



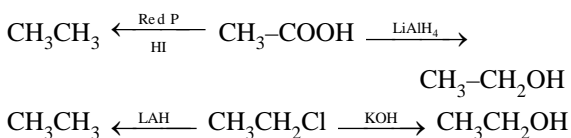
Q.11 (2)



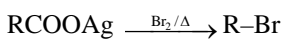
Q.12 (1)



Q.13 (C)



Q.14 (2)

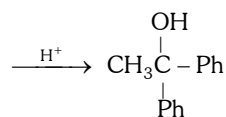
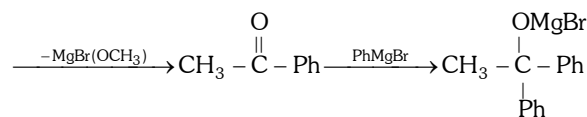
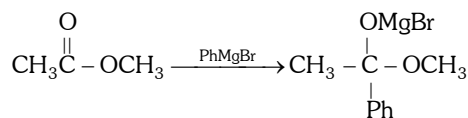


↓

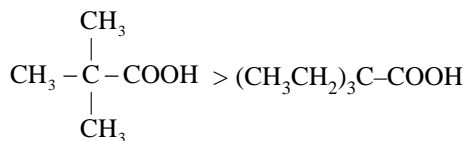
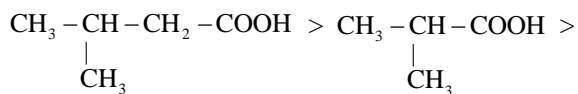
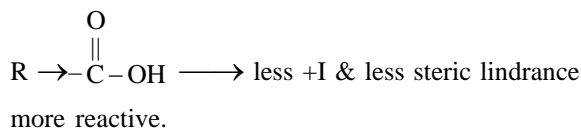
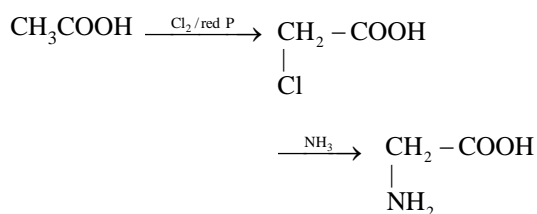
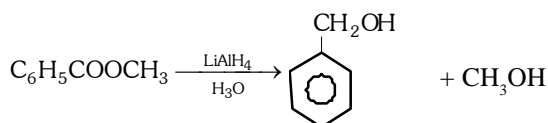
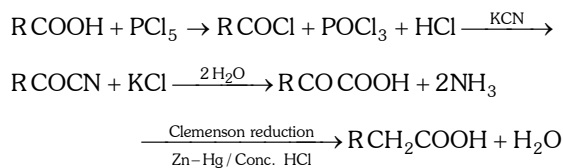
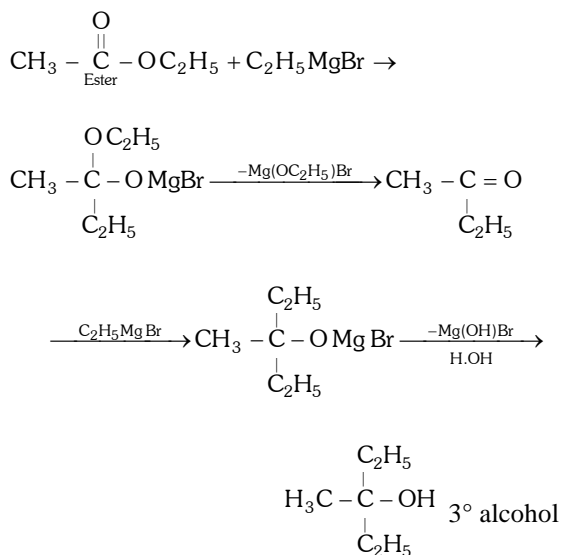
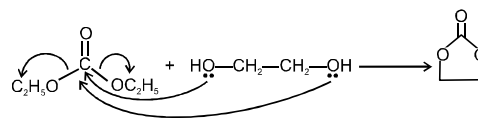
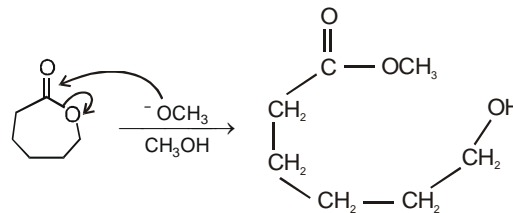
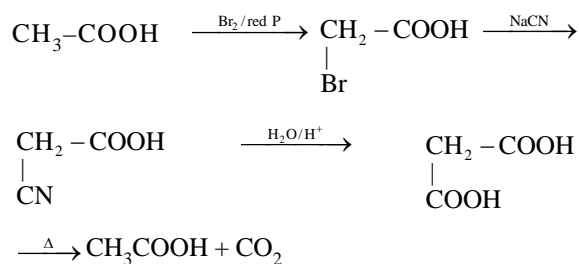
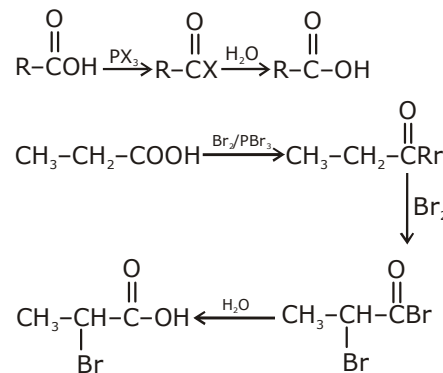
R⁻ → Intermediate

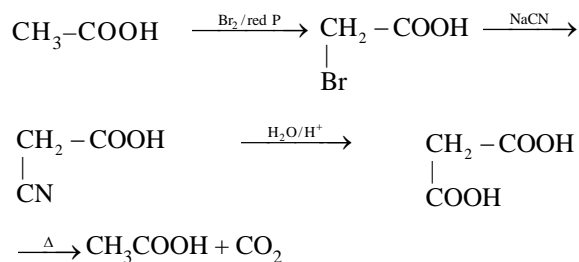
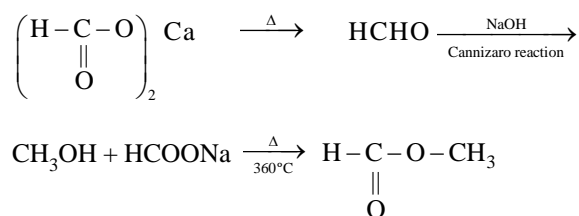
1° carbanion → most stable ⇒ reactivity ↑

Q.15 (1)

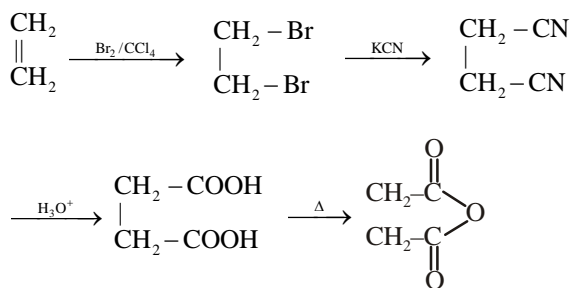


1,1-diphenylethanol

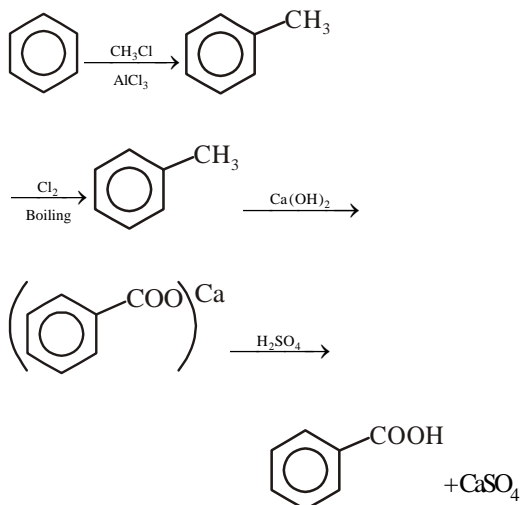
Q.16 (1)

Q.17 (1)

Q.18 (4)

Q.19 (2)

Q.20 (2)

Q.21 (C)

Q.22 (A)

Q.23 (1)

Q.24 D

 Br at α -carbon

Q.25 (A)

Q.26 (1)


Q.27 (3)

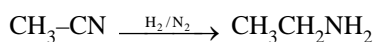
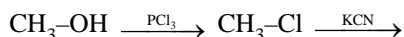


Q.28 (A)



Q.29 (2)

Q.30 (2)

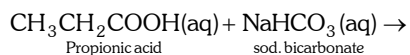


Q.31 (1)

Q.32 (3)

CH_3COOH does not give silver mirror test.

Q.33 (4)



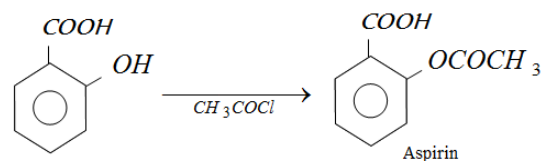
Q.34 (3)

Presence of methyl group decreases the acidic character of acetic acid due to positive inductive effect (+I).

Q.35 (3)

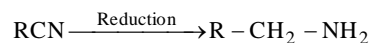
$\text{CH}_3 - \text{CH}_2 - \text{CCl}_2 - \text{COOH}$; α, α -dichloro butanoic acid is most acidic. Hence it will easily lose H^+ ions in solution

Q.36 (1)

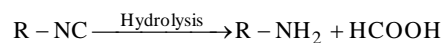
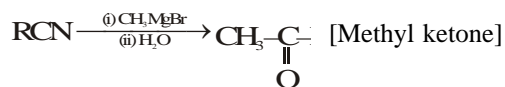


Q.37 (D)

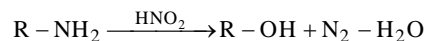
Q.38 (2)



[1° Amine]

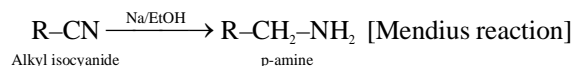
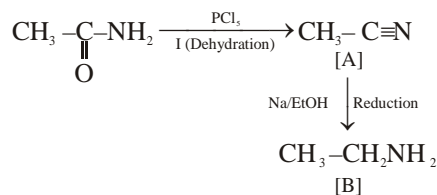


[1 Amine]

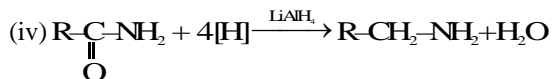
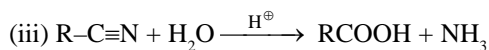
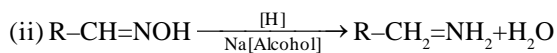
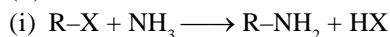


[Alcohol]

Q.39 (3)

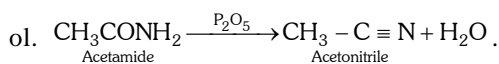


Q.40 (3)



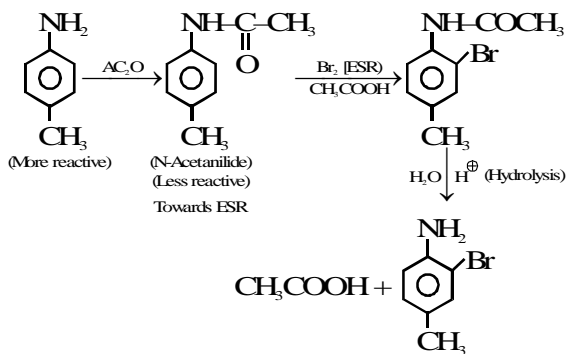
Q.41 (1)

Q.42 (1)

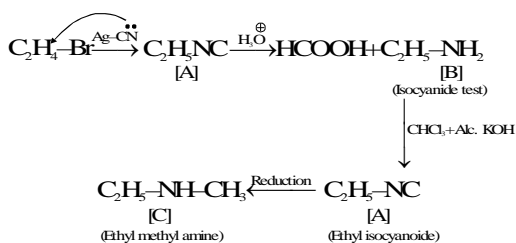


Q.43 (4)

Q.44 (1)

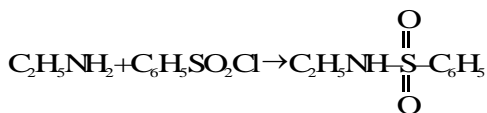
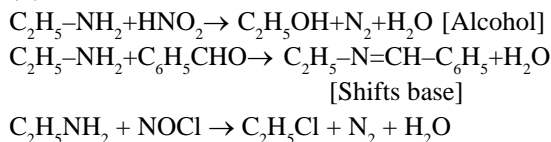


Q.45 (D)

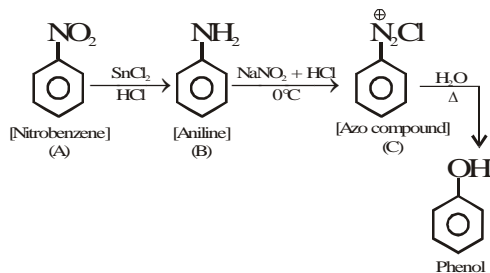
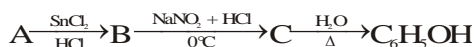


Q.46 (B)

Q.47 (2)

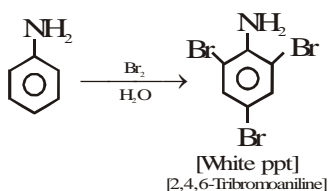


Q.48 (2)



Q.49 (1)

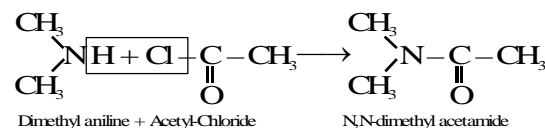
Q.50 (3)



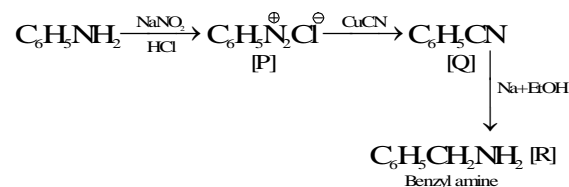
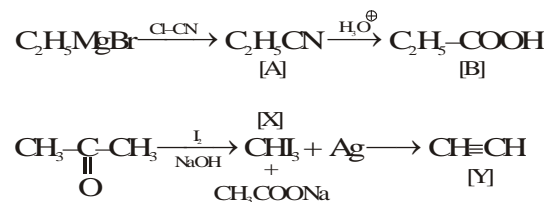
Since aniline is more reactive towards ESR and in polar solvent [water] concentration of $\text{E}^\oplus[\text{Br}^\ominus]$ is also in good yield so Br^\oplus will attack on all o & p position of molecule.

Q.51 (C)

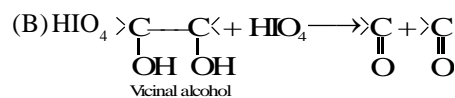
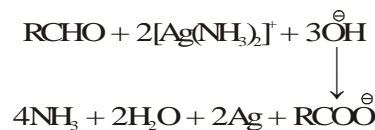
Q.52 (3)



Q.53 (1)



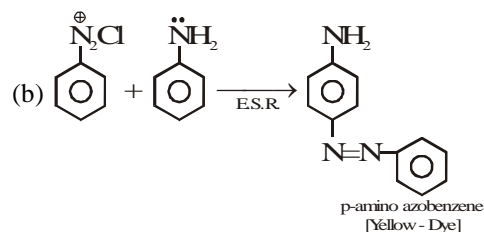
Q.54 (3)

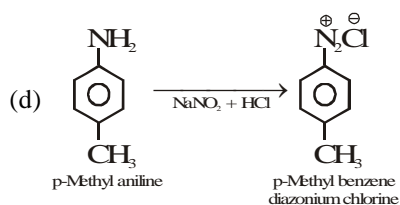
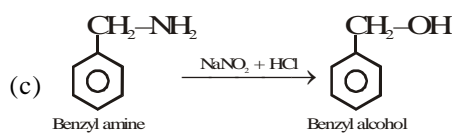
 (A) Ammonical AgNO_3 [Tollen's reagent]


(C) Alk. KMnO_4 [1% alk. cold dil.] \rightarrow Bayer's reagent \rightarrow Test of unsaturated

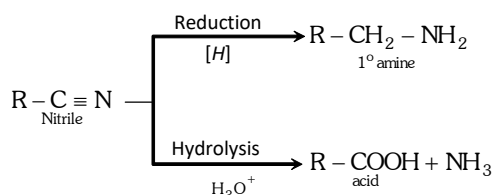
(D) $\text{R-NH}_2 + \text{CHCl}_3 + \text{NaOH} \rightarrow \text{R-N}\equiv\text{C} + 3\text{KCl} + 3\text{H}_2\text{O}$

Q.55 (4)

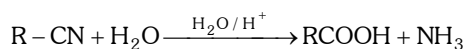
 (a) $>\text{C}=\text{NH}-\text{R}$ structure will be Schiff's Base.




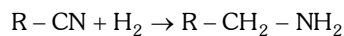
Q.56 (2)



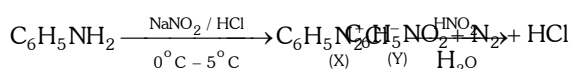
Q.57 (C)



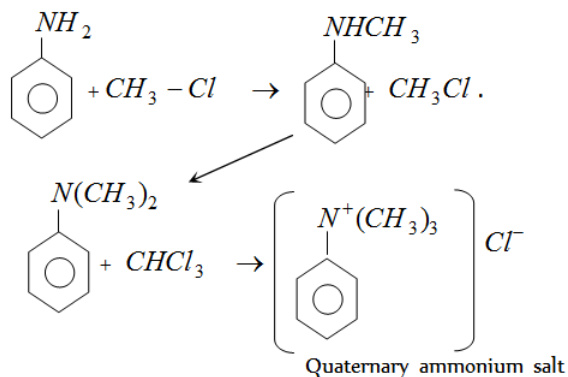
It yield amine when reduced as –



Q.58 (3)

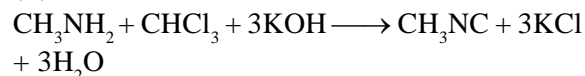


Q.59 (3)



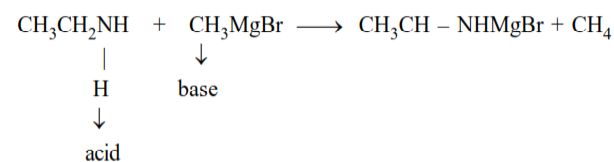
Q.60 (A)

Q.61 (B)

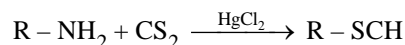


Carbylamine reaction.

Q.62 (4)



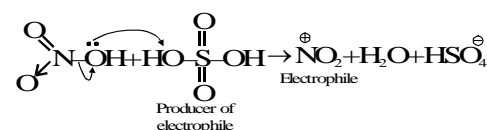
Q.63 (4)



Hoffmann mustard oil reaction.

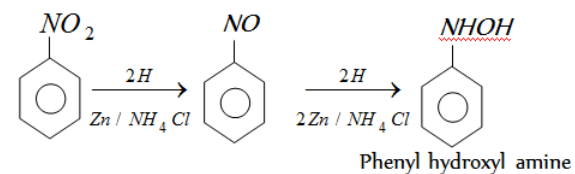
Q.64 (4)

Q.65 (4)

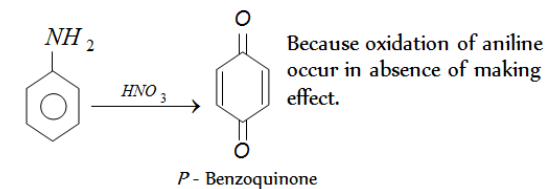


Q.66 (3)

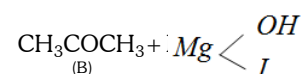
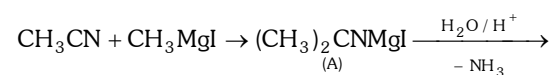
Q.67 (4)



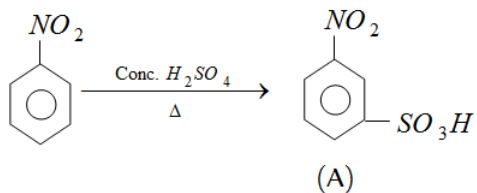
Q.68 (3)



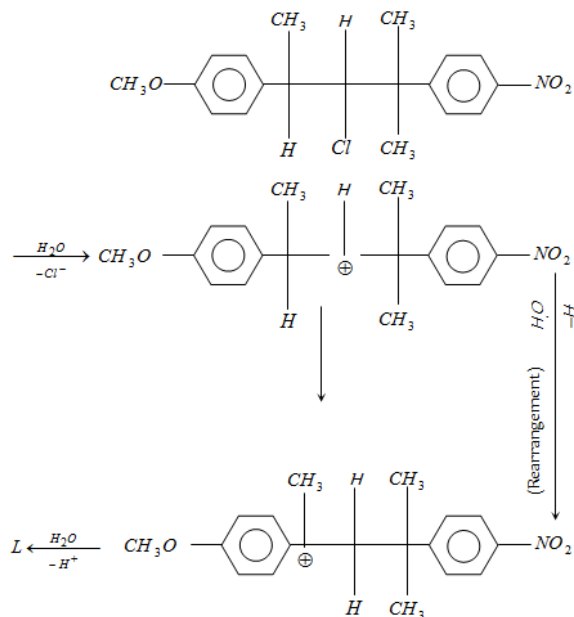
Q.69 (2)



Q.70 (B)



Q.71 (1)



Q.72 (2)

Q.73 (1)

Q.74 (1)

Q.75 (1)

Q.76 (1)

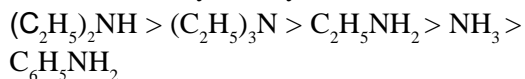
Q.77 (4)

 Allyl isocyanide. $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{N} \equiv \text{C}$

Q.78 (2)

Q.79 (4)

Order of basicity of ethyl amines.

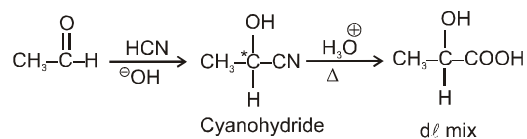


Q.80 (2)

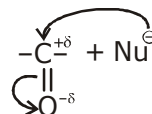
JEE-ADVANCED

OBJECTIVE QUESTIONS

Q.1 (B)



Q.2 (A)



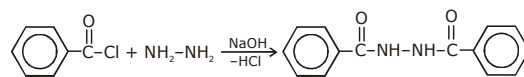
Acyl carbon shows addition elimination mechanism by attack of Nucleophilic.

Q.3 (B)

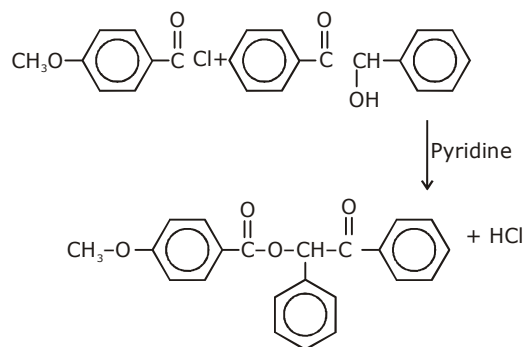
Q.4 (C)

Primary amines, secondary amines and ammonia all react rapidly with acid chlorides to form amides, This reaction takes place at room temperature and gives high yield.

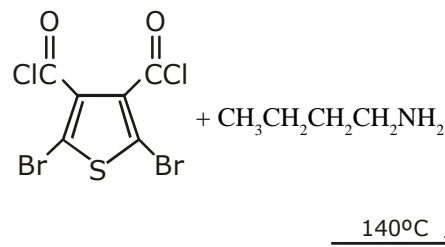
Q.5 (D)

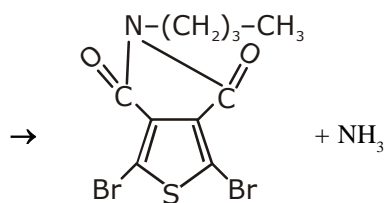
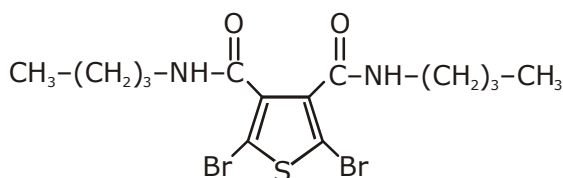


Q.6 (C)

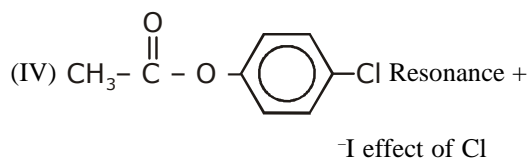
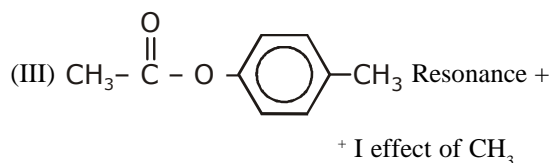
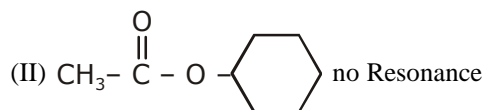
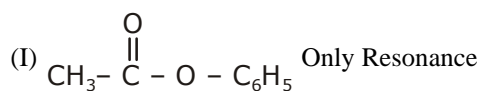


Q.7 (C)





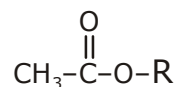
Q.8 (A)



Q.9 (B)

-M effect (-CHO) < -M effect (-NO₂)

Q.10 (A)



Reactivity order of saponification of esters
1°R > 2°R > 3°R

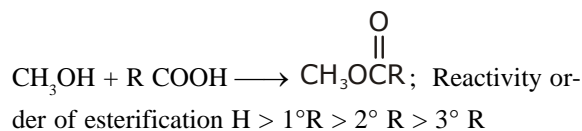
Q.11 (A)

(I) $\text{NO}_2-\text{C}_6\text{H}_4-\text{COOC}_2\text{H}_5$ is more reactive because of -M effect of -NO₂

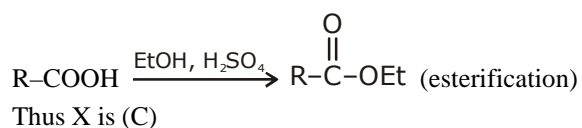
(II) $\text{NO}_2-\text{C}_6\text{H}_4-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ is more reactive

because of -M effect of -NO₂ > -M effect (-OCH₃)
(III) 6 member ring is less reactive to 4 member ring.

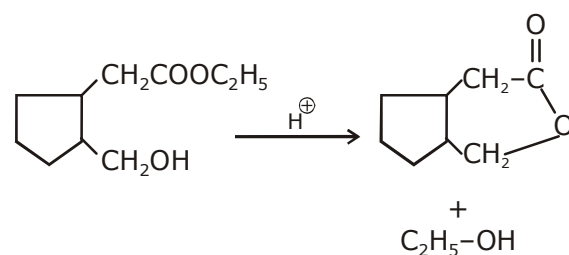
Q.12 (B)



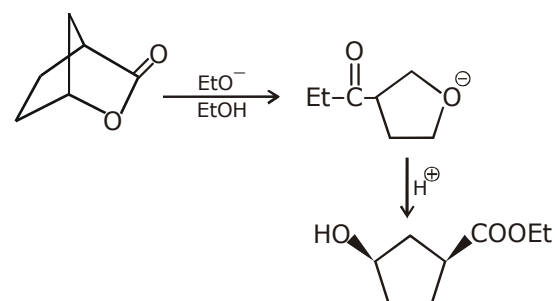
Q.13 (C)



Q.14 (C)



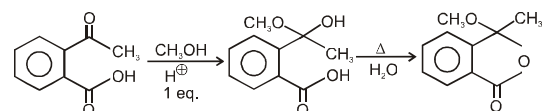
Q.15 (B)



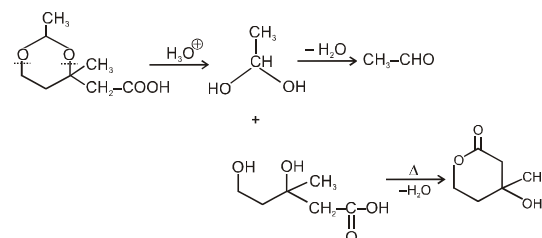
Q.16 (B)

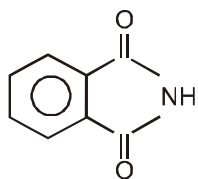
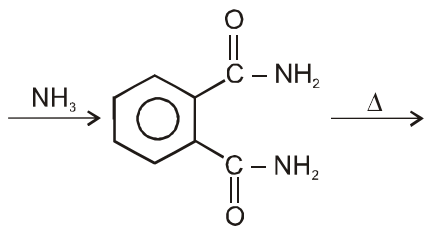
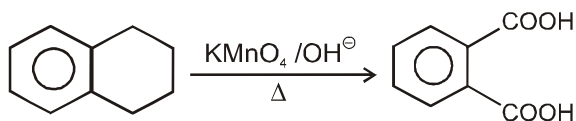
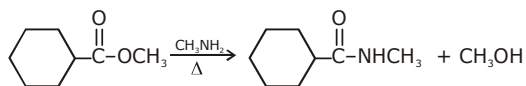
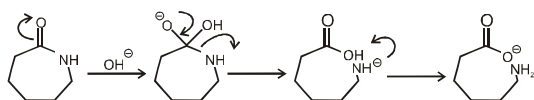
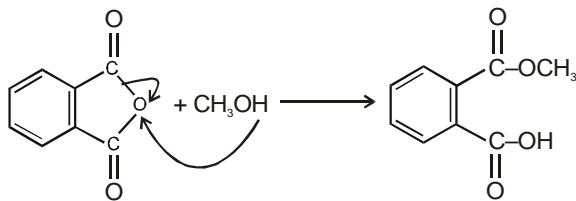
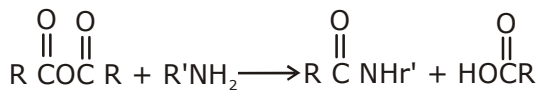
Ease of esterification for alcohols ∝ more acidic alcohols

Q.17 (D)

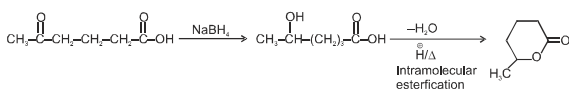
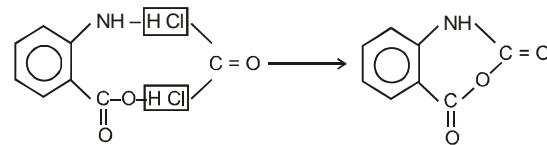
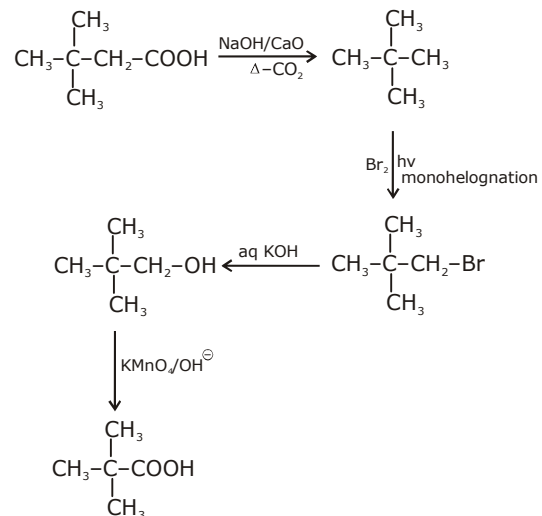
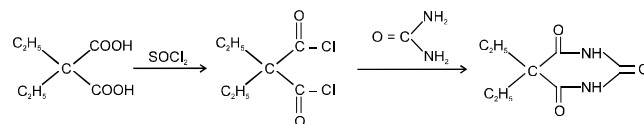
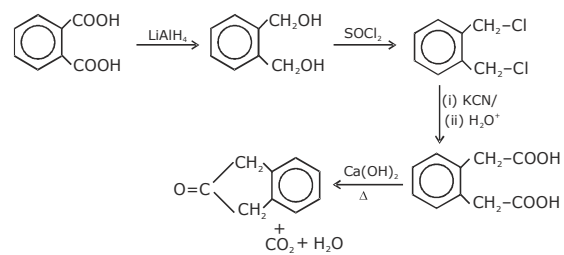
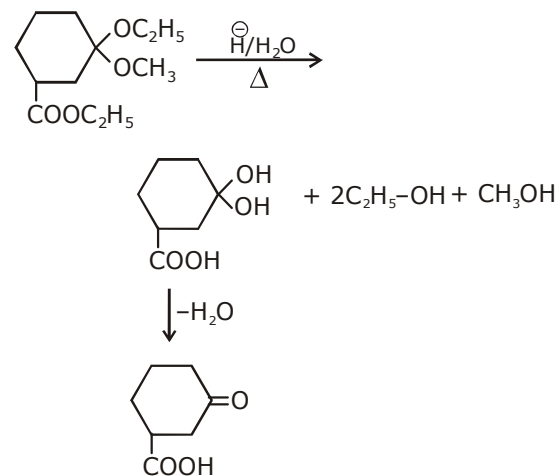


Q.18 (C)

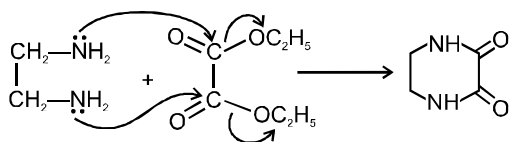


Q.19 (C)

Q.20 (C)

Q.21 (A)

Q.22 (B)

Q.23 (A)


Thus X=(A)

Q.24 (A)

Q.25 (D)

Q.26 (C)

Q.27 (B)

Q.28 (A)

Q.29 (D)


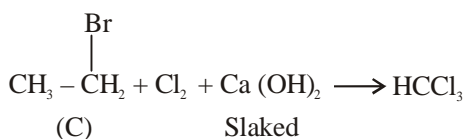
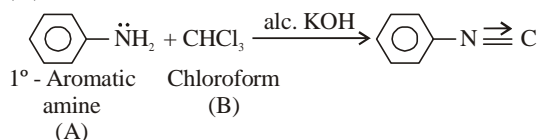
Q.44 (B)



Q.45 (A)



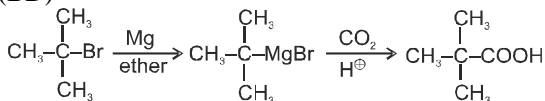
Q.46 (B)



Q.47 (C)

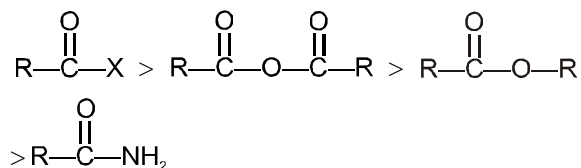
JEE-ADVANCED
MCQ/COMPREHENSION/COLUMN MATCHING

Q.1 (BD)



Q.2 (ABD)

Hydrolysis of acid derivative is an $\text{S}_{\text{N}}2$ reaction and the reactivity of acid derivatives towards $\text{S}_{\text{N}}2$ is



Q.3 (ACD)

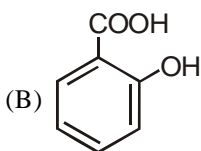
Rate of esterification $\propto \frac{1}{\text{Steric crowding}}$

Q.4 (BCD)

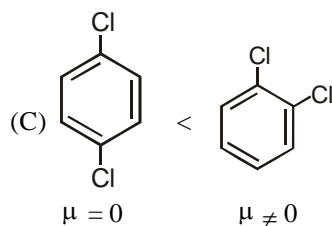
It is Hoffmann bromamide reaction which is 100% intramolecular.

Q.5 (CD)

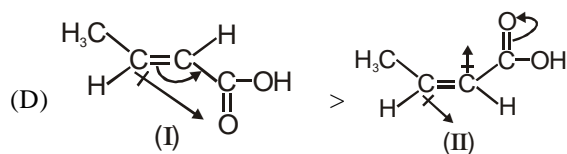
(A) Surface area decrease, solubility increase, so a is wrong order.



In it, due to the presence of intramolecular H-bonding the solubility is decrease, so b is wrong order.



so like dissolve like it is correct.



Its dipole moment is higher than II, then we say like dissolve like.

Q.6

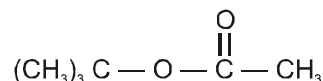
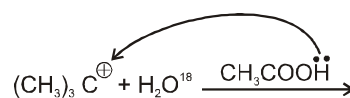
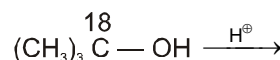
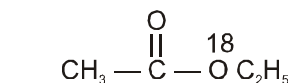
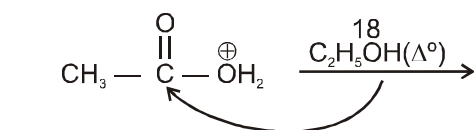
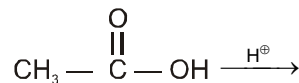
(BD)

Dipole moment of cis isomer > dipole moment of trans isomer and hence water solubility also of cis isomer is greater than trans isomer.

Comprehension-1 (Q. No. 7 to 9)

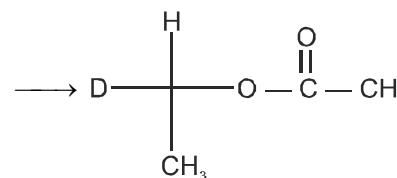
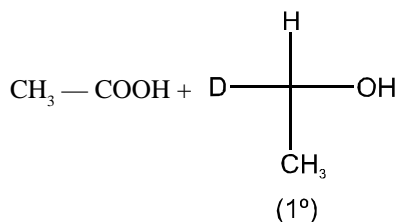
Q.7

(B)

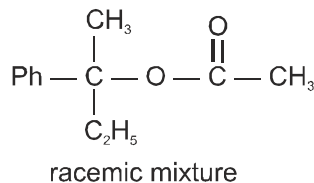
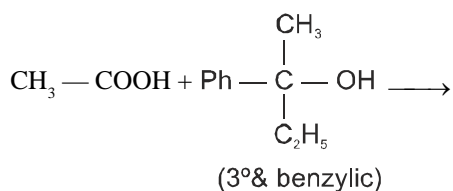


Q.8

(A)



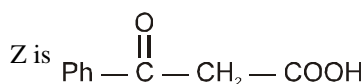
optically active



- Q.9** (B)
Since (+) Octan-2-ol racemises on reaction with acetic acid, therefore it must have gone through an $\text{S}_{\text{N}}1$ reaction i.e., type II reaction.

Comprehension-2 (Q. No. 10 to 12)

- Q.10** (C)



- Q.11** (D)
X is an anion and it has no acidic hydrogen.

- Q.12** (D)
any mono substituted benzene oxidises to benzoic acid.

Comprehension-3 (Q. No. 13 to 15)

- Q.13** (B)
Hoffmann rearrangement is only shown by 1° amide.

- Q.14** (D)
Rate of reaction in hoffmann rearrangement among difference amide depends on migratory aptitude of group in the amide.

- Q.15** (B)
Hoffmann rearrangement is 100% intramolecular. one amide will give only one amine with $\text{Br}_2/\text{OH}^\ominus$.

Comprehension-4 (Q. No. 16 to 18)

- Q.16** (A)
This is a Hoffmann bromamide reaction in which Br_2/HO^- i.e. NaOBr is used.

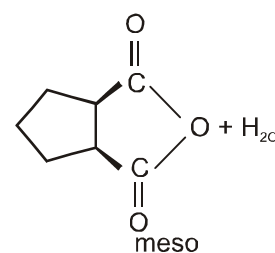
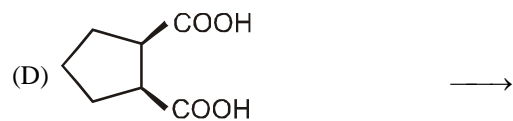
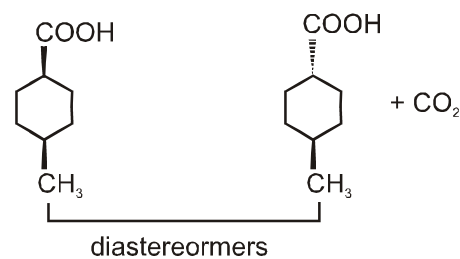
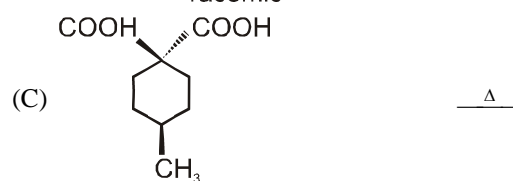
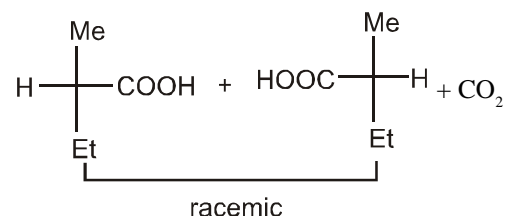
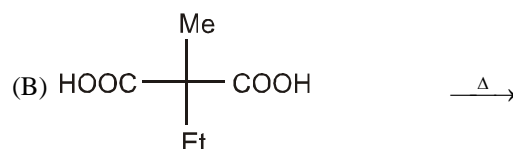
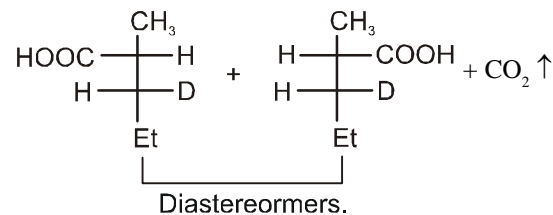
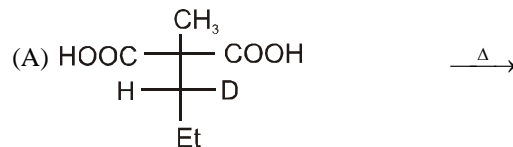
- Q.17** (B)
In this reaction migration of alkyl or aryl group is rate determining step.

- Q.18** (C)
This is a 100% intramolecular reaction and no cross product is formed.

- Q.19** (A) - (s) ; (B) - (q, s) ; (C) - (p, s) ; (D) - (p, r, s)

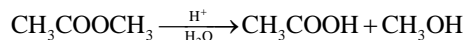
- (A) It will be an acid base reaction.
(B) it is an acid catalysed esterification.
(C) it is an acid catalysed hydrolysis.
(D) It is a base catalysed hydrolysis which is also known as saponification

- Q.20** (A) - p, s ; (B) - q, s ; (C) - p, s ; (D) - r



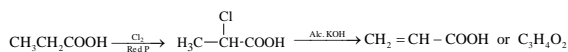
NUMERICAL VALUE BASED

Q.1 [2]



Q.2 [3]

Q.3 [2]



Q.4 [6]

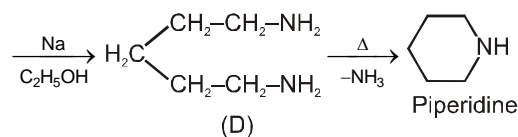
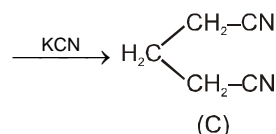
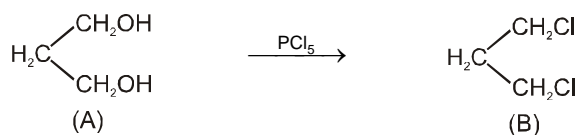
Dcarboxylation occurs via six membered transition state.

Q.5 [1]

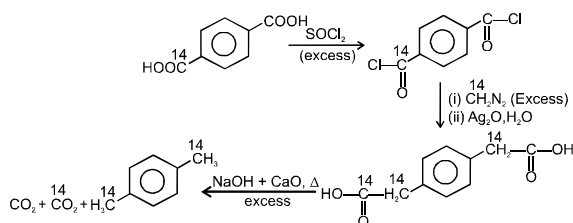
Hydroxide ion promotes only hydrolysis reaction. It can't promote trans esterification reactions as anion of the acid will be formed from ester. In acetaldehyde only alpha hydrogens are exchanged.

Q.6 [8]

(A) \Rightarrow Colour with ceric ammonium nitrate
 \Rightarrow Alcoholic group.



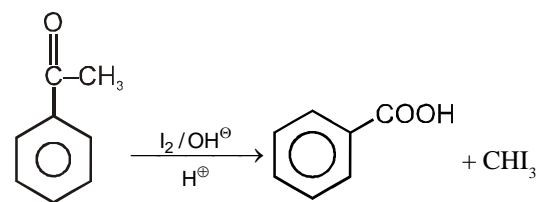
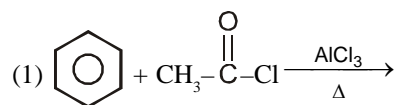
Q.7 [2]



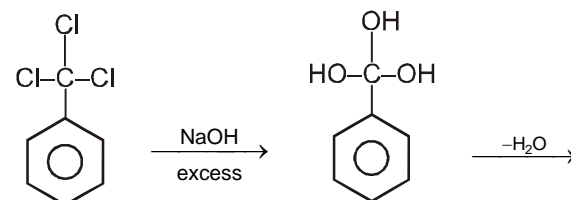
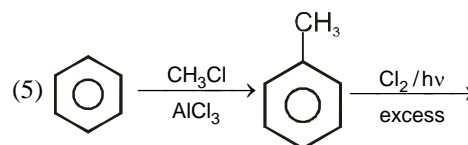
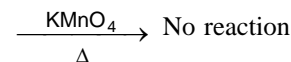
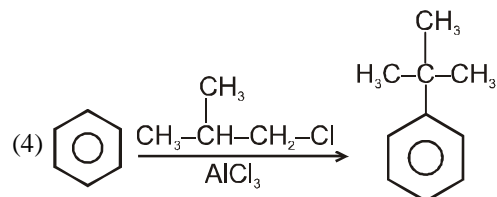
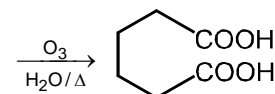
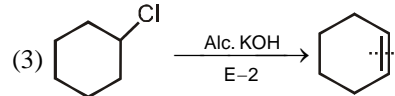
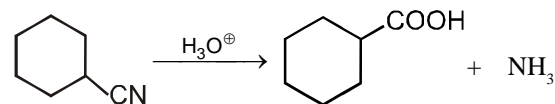
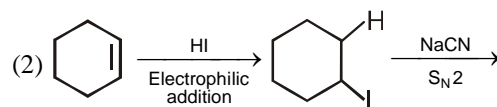
Q.8 [3]

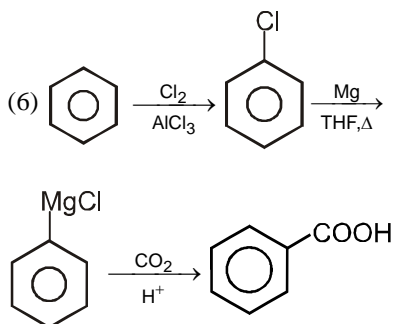
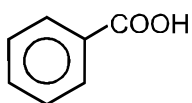
Three products can be formed namely 1,4,9 In Hofmann bromamide reaction there is intramolecular migration of alkyl or aryl groups so cross products are not formed.

Q.9 [5]

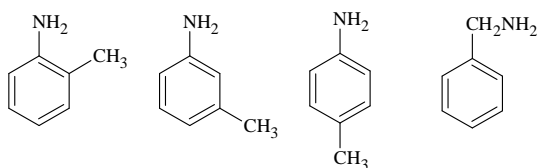


Friedel craft acylation
Iodoform reaction



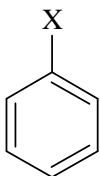


Q.10 [4]



Q.11 [5]

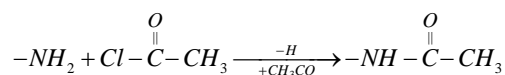
Only primary amines can be prepared by this method. The second step involves S_N2 reaction. Therefore



and $\text{CH}_2 = \text{CH} - \text{X}$ are not expected to give S_N2 .

Q.12 [4]

The chemical reaction involved is as follows:



Net increase in mol. Mass on acylation of one $-\text{NH}_2$ group = Mol. Mass of CH_3CO group - At. Mass of H = 43 - 1 = 42

Actual increase in mol. Mass on acylation = 348 - 180 = 168

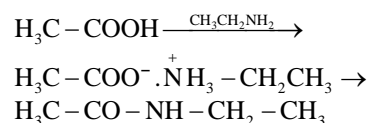
no. CH_3CO group added = 168/42 = 4

Hence the compound has 4 - NH_2 groups.

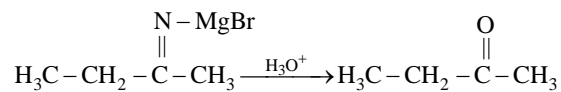
KVPY

PREVIOUS YEAR'S

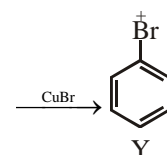
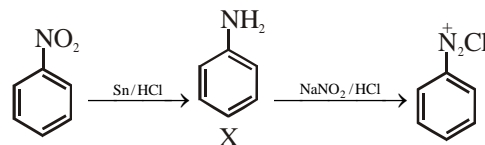
Q.1 (A)



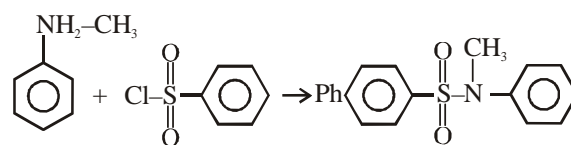
Q.2 (3)



Q.3 (B)

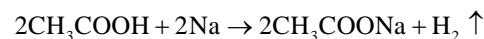


Q.4 (A)

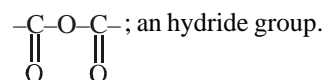


No acidic hydrogen (insoluble in alkali)

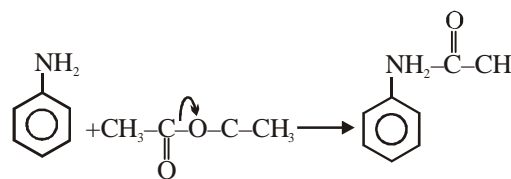
Q.5 (B)



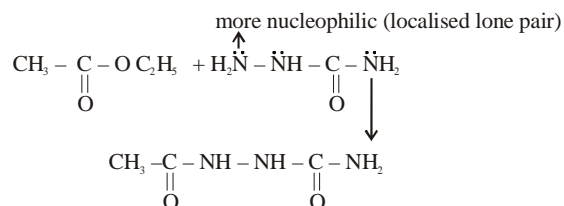
Q.6 (A)



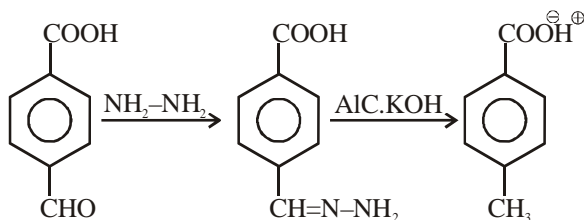
Q.7 (A)



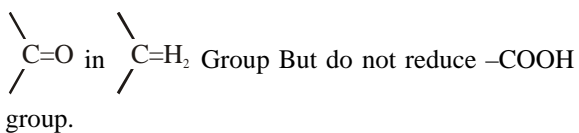
Q.8 (C)



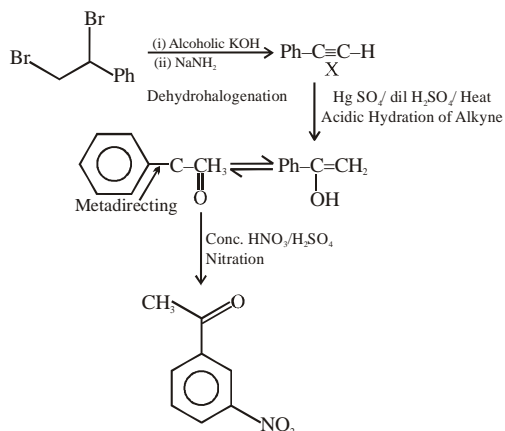
Q.9 (B)



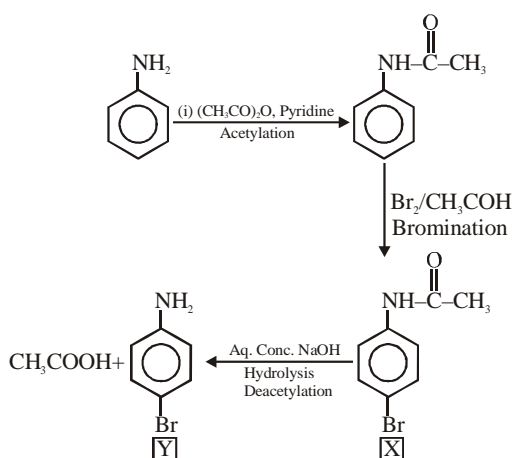
This is example of wolfkishner reduction which converts.



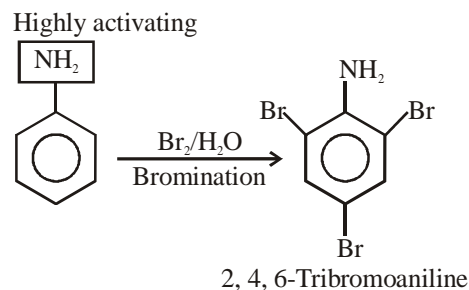
Q.10 (A)



Q.11 (A)

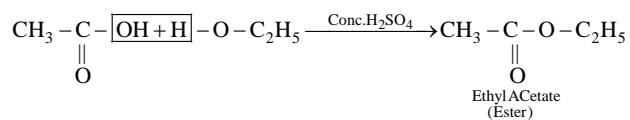


Q.12 (A)

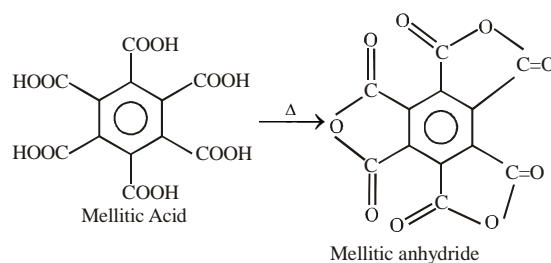


Q.13 (A)

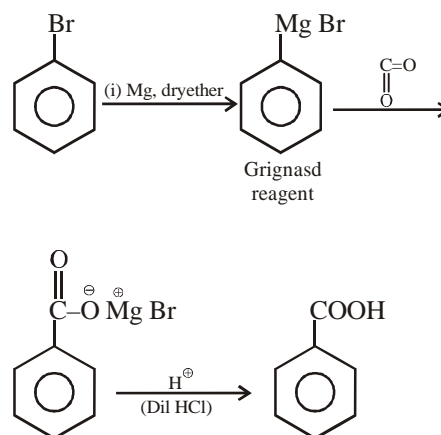
Esterification



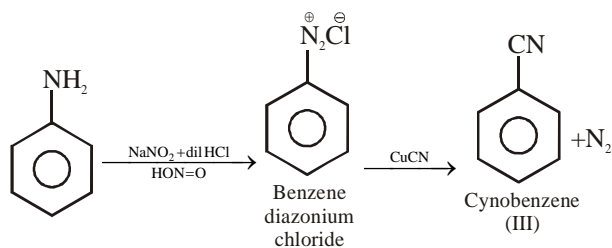
Q.14 (B)

 Carbon (graphite) $\xrightarrow[\text{By KMnO}_4 \text{ with acidic conditions}]{\text{Oxidation}}$


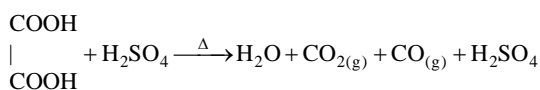
Q.15 (C)



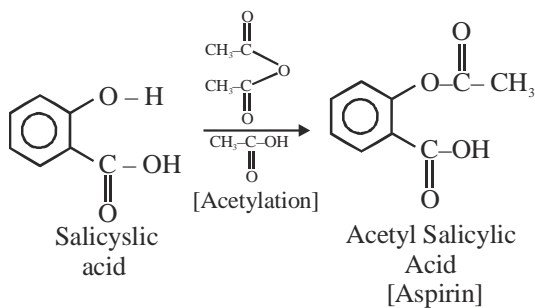
Q.16 (C)



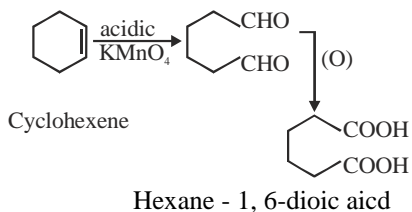
Q.17 (A)



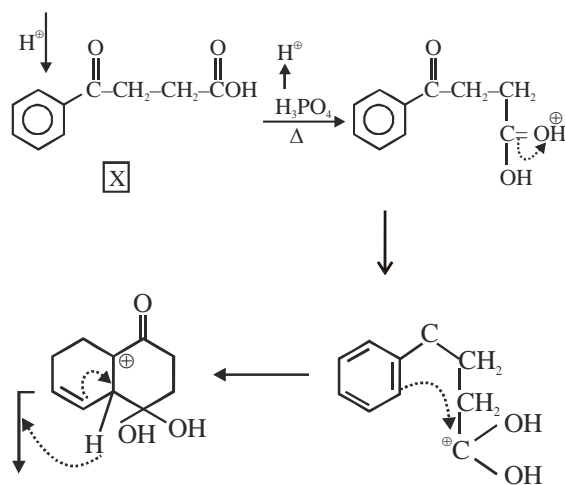
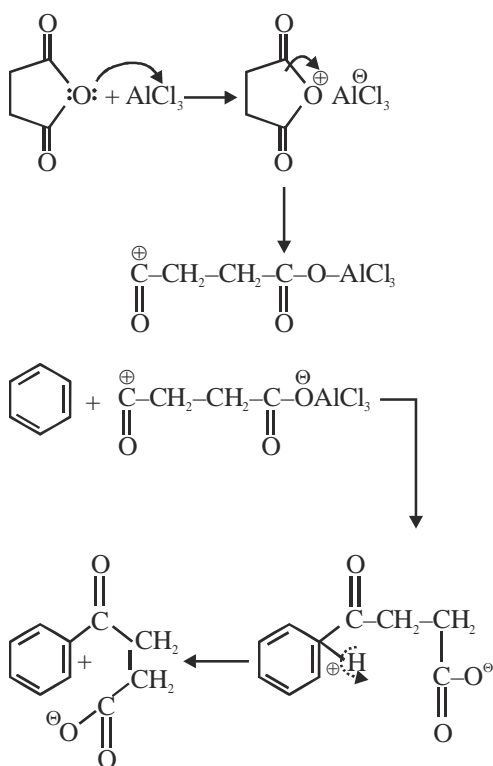
Q.18 (B)



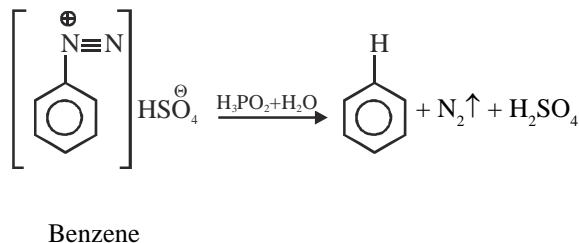
Q.19 (B)



Q.20 (A)



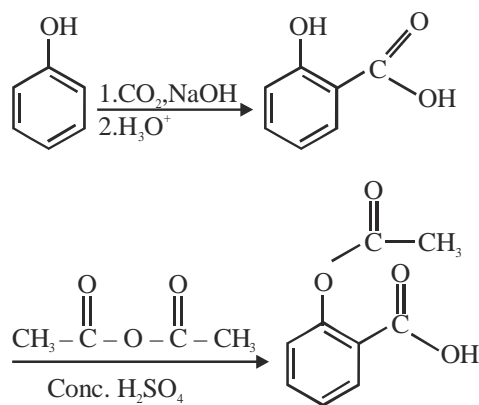
Q.21 (B)

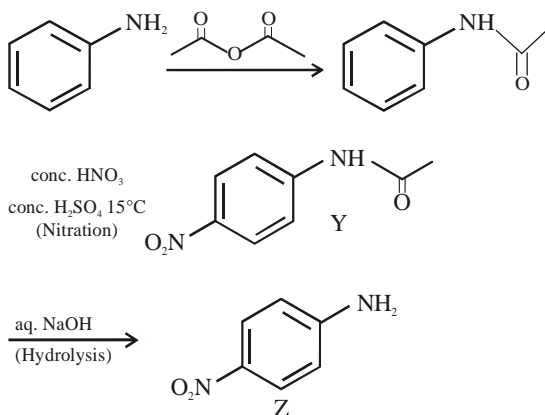
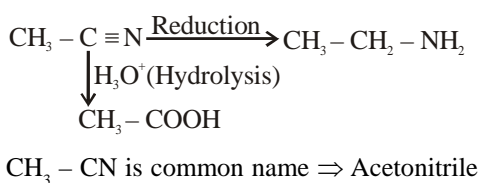
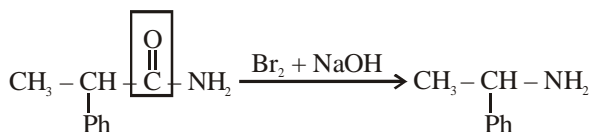
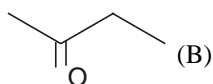
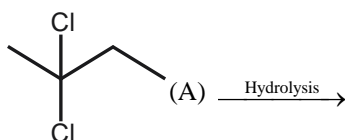


Q.22 (C)

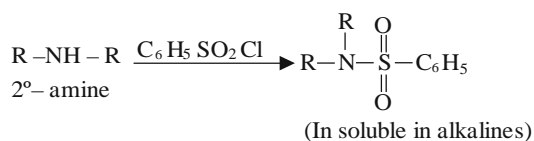
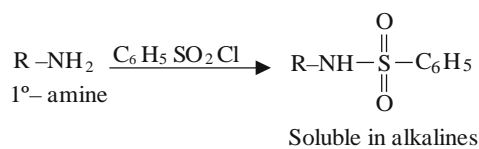
This is a Name Reaction to prepare 1° amine.

Q.23 (A)

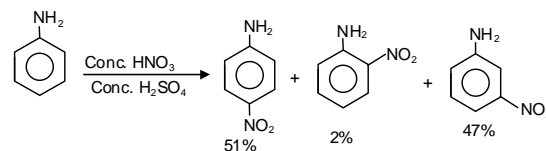


Q.24 (B)

Q.25. (A)

Q.26 (B)

**JEE MAINS
PREVIOUS YEAR'S**
Q.1 (1)


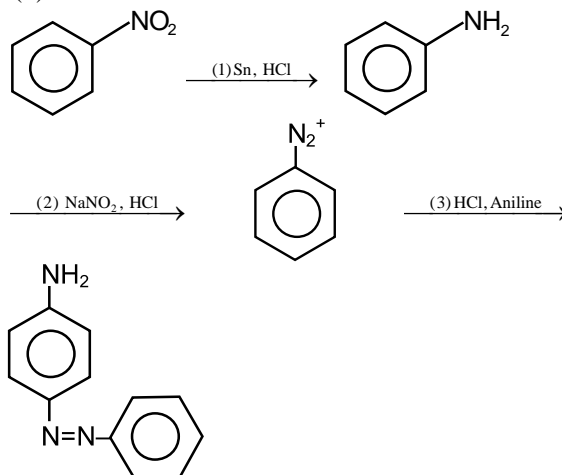
2-Butanone forms oxime with NH₂OH but does not give Tollen's test.

Q.2 (a)


According to the question the amine should be amine, in which one of the alkyl group should will, because it can be formed by

Q.3 (2)


In acidic medium, aniline is converted into anilinium ion which is meta directing so meta product is formed in significant amount.

Q.4 (2)

Q.5 (3)
Q.6 (4)

In acidic medium, aniline is converted into anilinium ion which is meta directing

Q.7 (3)

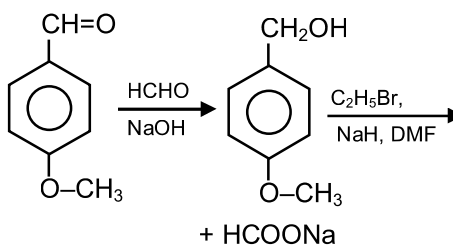
Alcohols give positive test with ceric ammonium nitrate and primary amines gives carbyl amine test with CHCl₃, KOH.

Q.8 (3)

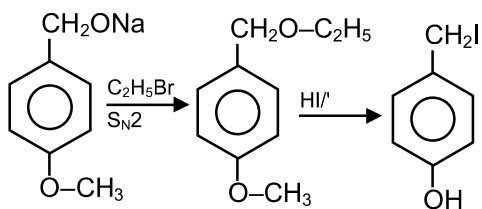
Only aliphatic amines can be prepared by Gabriel phthalimide synthesis.

Q.9 (4)

Only aromatic Primary amines will gives Dye test.

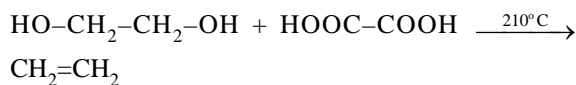
Q.10 (1)


Q.17(4)

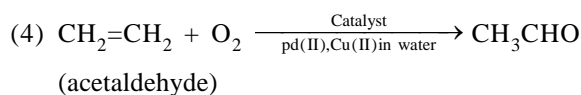
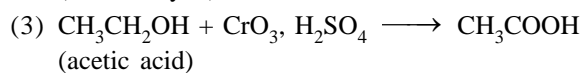
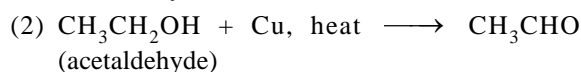


Q.11 (2)

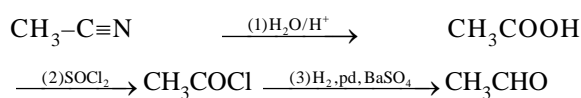
Q.12 (2)



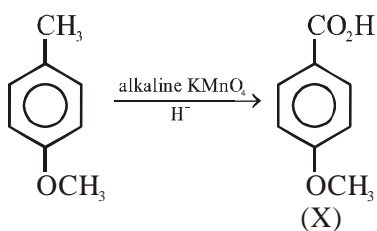
Q.13 (3)



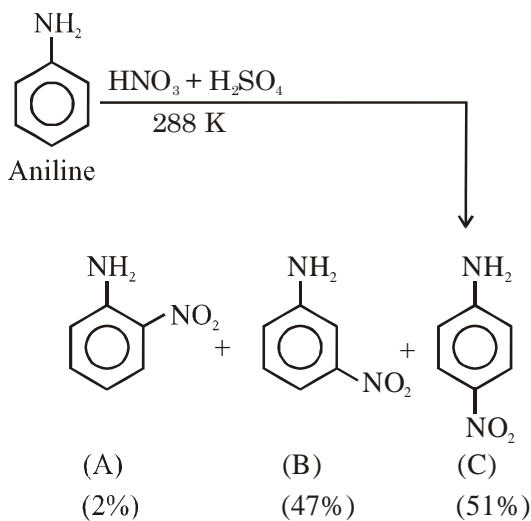
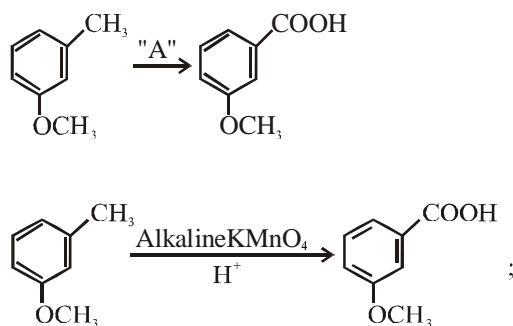
Q.14 (1)



Q.15 (3)

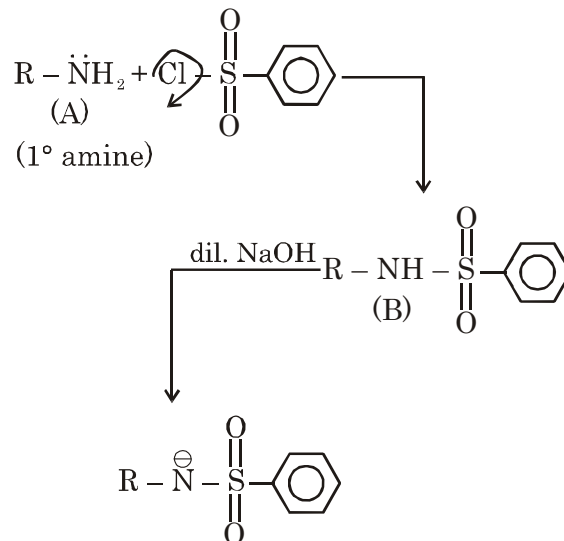


Q.16 (3)

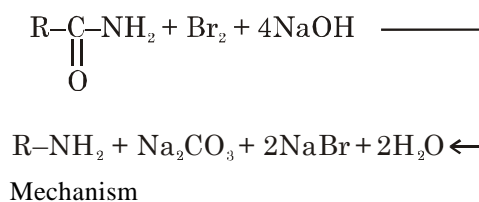
% yield order $\Rightarrow C > B > A$

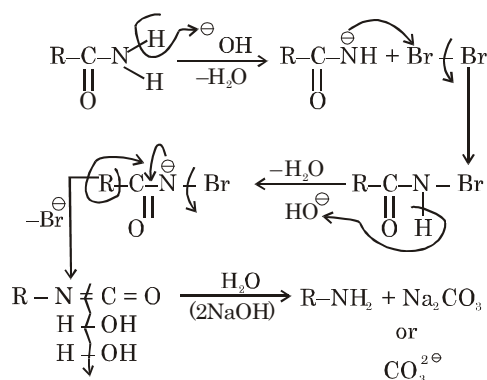
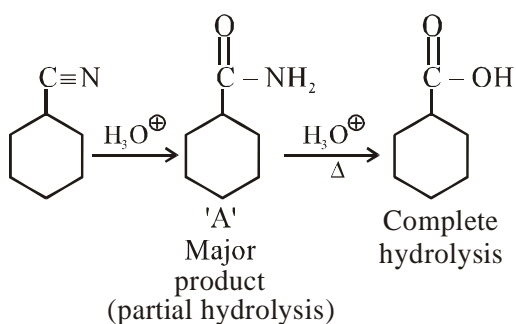
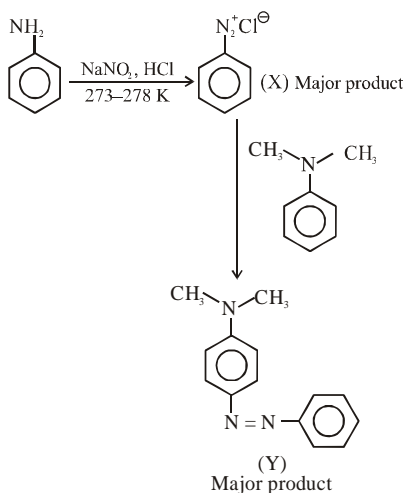
Q.18 (4)

Hinsberg reagent (Benzene sulphonyl chloride) gives reaction product with 1° amine and it is soluble in dil. NaOH.



Q.19 (1)

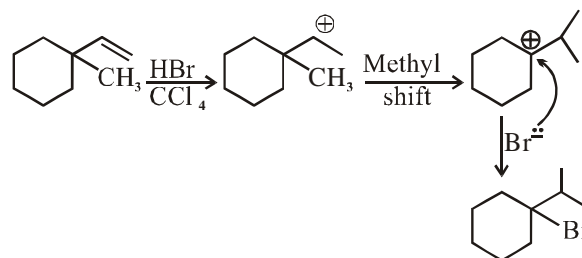



Q.20 (3)

Q.21 (2)

Q.22 (1)

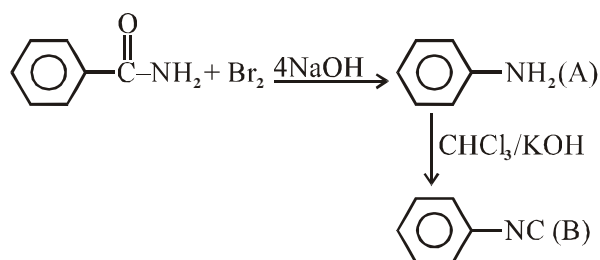
Primary amines react with Para Toluene sulfonyl chloride to form a precipitate that is soluble in NaOH. Secondary amines reacts with para toluene sulfonyl chloride to give a precipitate that is insoluble in NaOH. Tertiary amines do not react with para toluen.

Q.23 (4)

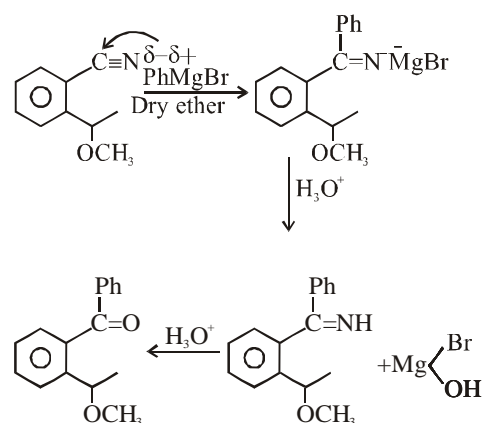
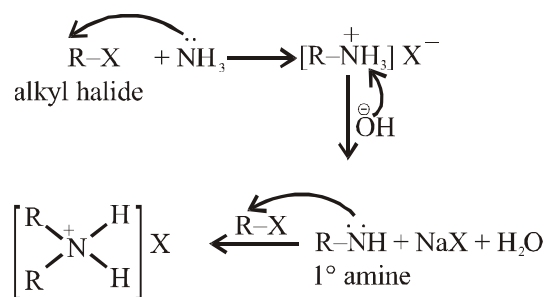
The process of cleavage of the C-X bond by Ammonia molecule is known as ammonolysis.

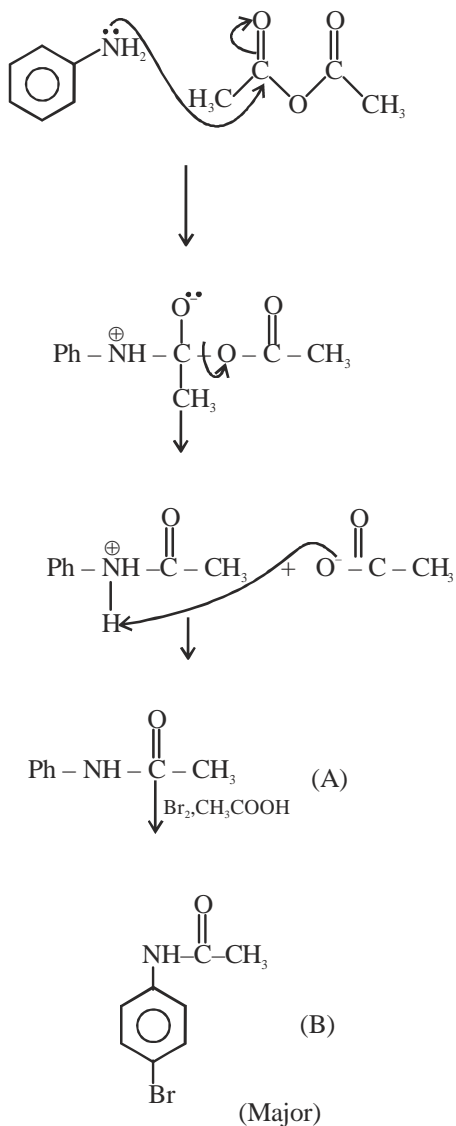
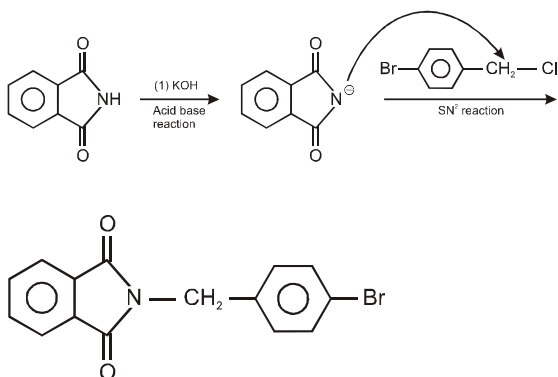
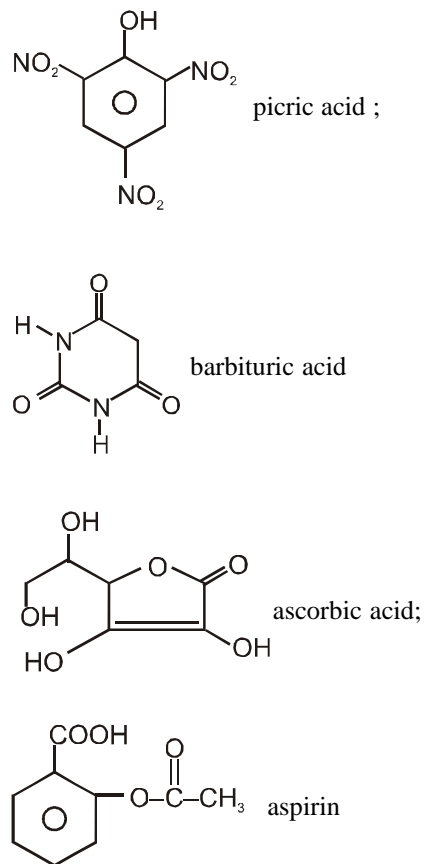

Q.24 (4)

Q.25 (2)

Hoffmann bromamide degradation reaction :



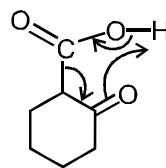
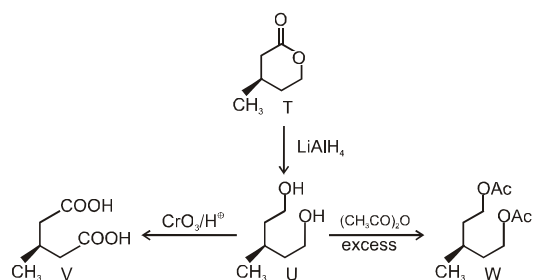
Carbylamine reaction

Q.26 (4)

Q.27 (3)


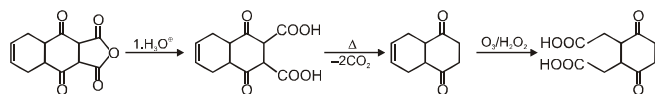
Q.50 (2)

**JEE-ADVANCED
PREVIOUS YEAR'S**
Q.1 (A)

Q.2 (D)

Q.3

(B)

In decarboxylation, α -carbon acquires δ^- charge. Whenever δ^- charge is stabilized, decarboxylation becomes simple. In (B), it is stabilized by $-m$ & $-I$ of $\text{C}=\text{O}$, which is best amongst the options offered,

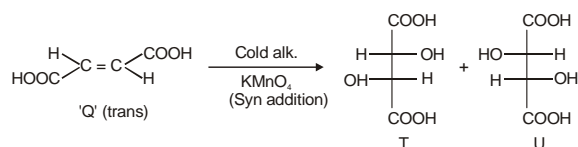
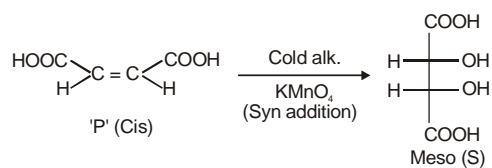

Q.4 (A,C,D)


Q.5 (2)

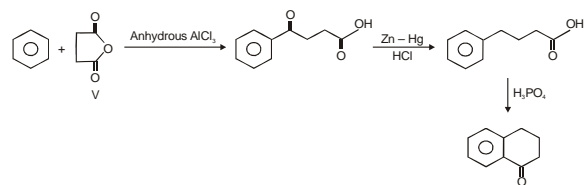
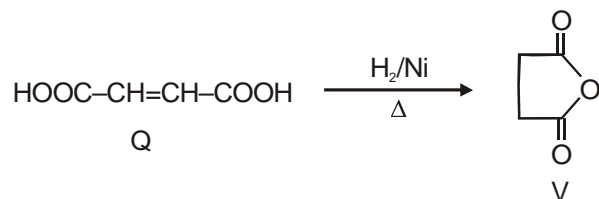
No. of $-\text{COOH}$ group is '2'.

Comprehension (Q. No. 6 to 7)

Q.6 (B)

Q.7 (A)
(6 & 7)

(Racemic Mixture)



Q.8 (A)

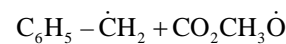
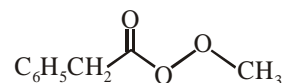
Allylic radical are more stable than alkyl radical, so when there is a possibility of formation of allyl radical, it will undergo fragmentation through formation of allyl radical, i.e. fragmentation produces stable radical.

On the basis of stability of radical, fragmentation can be done as

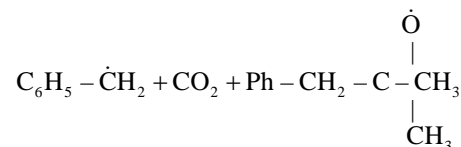
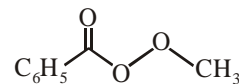
Column I

Explanation

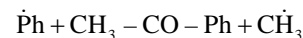
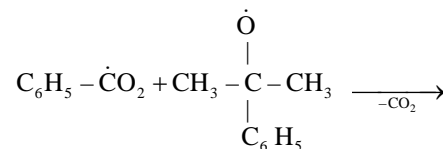
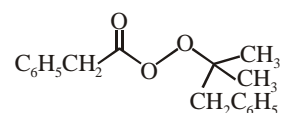
P. Pathway P



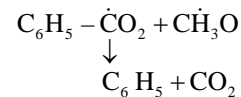
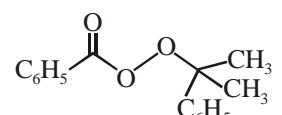
Q. Pathway Q



R. Pathway R



S. Pathway S

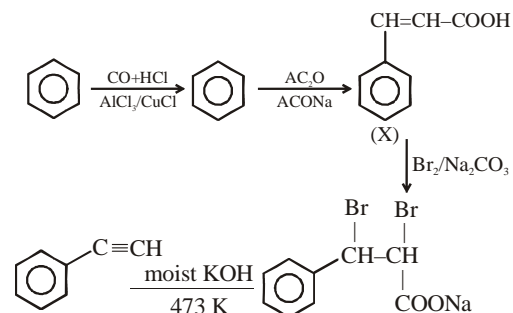


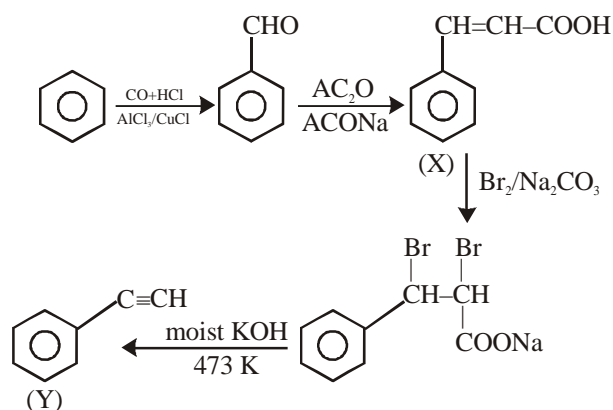
Codes

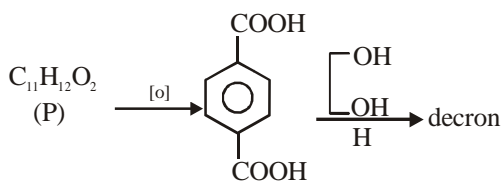
P-1, Q-3, R-4, S-2

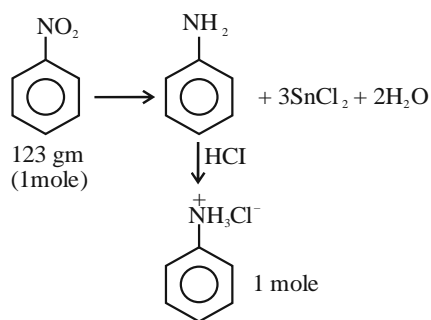
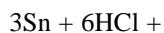
Comprehension (Q. No. 9 to 10)

Q.9 (C)



Q.10 (A)

Comprehension (Q. No. 11 to 12)
Q.11 (A)

Q.12 (B)

Question Stem for Question Nos. 13 and 14
Q.13 [3. 57]

 The value of **x** is


$$(72 + 8 + 35) + 14$$

$$= 129 \text{ gm (molecular weight of organic salt)}$$

So to get 1.29 gm organic salt.

We have to form 0.01 mole salt.

So 0.01 mole nitrobenzene is required.

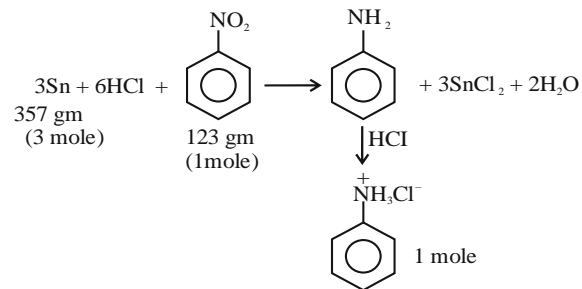
0.03 mole Sn is required.

So the amount of nitrobenzene

$$= 0.01 \times 123 = 1.23 \text{ gm}$$

$$\text{the amount of Sn required} = 0.01 \times 357 = 3.57 \text{ gm}$$

Ans. 3.57 & 1.23
Q.14 1. 23

 The value of **y** is


$$(72 + 8 + 35) + 14$$

$$= 129 \text{ gm (molecular weight of organic salt)}$$

So to get 1.29 gm organic salt.

We have to form 0.01 mole salt.

So 0.01 mole nitrobenzene is required.

0.03 mole Sn is required.

So the amount of nitrobenzene

$$= 0.01 \times 123 = 1.23 \text{ gm}$$

$$\text{the amount of Sn required} = 0.01 \times 357 = 3.57 \text{ gm}$$

Ans. 3.57 & 1.23

Biomolecules

EXERCISES

ELEMENTARY

Q.1 (1)
All are optically active.

Q.2 (3)

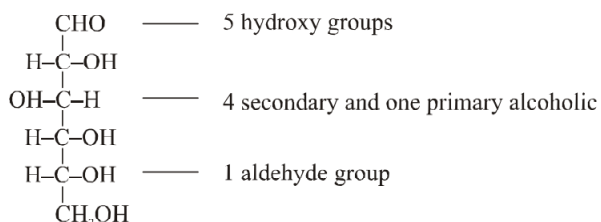
Q.3 (3)
Threose = $C_4H_8O_4$

Q.4 (2)

Q.5 (3)
Carbohydrates are hydrates of carbon. Their general formula is $C_x(H_2O)_y$

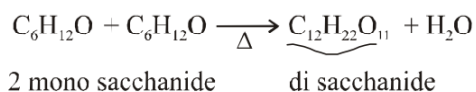
Q.6 (1)

Q.7 (4)



Q.8 (4)

Q.9 (2)



Q.10 (1)

Q.11 (2)

Sucrose is not a reducing sugar.

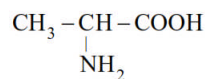
Q.12 (1)

Q.13 (1)

Maltose is made up of 2 glucose molecules.

Q.14 (4)

Q.15 (3)



alanine (α amino propionic acid)

Q.16 (3)

Isoelectric point is a pH at which zwitter ions do not migrate towards any of the electrode.

Q.17 (2)

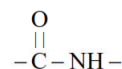
Q.18 (1)

Q.19 (1)

Q.20 (3)

Q.21 (4)

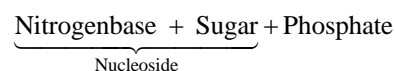
The linkage in protein is a amide (Peptide) bond.



Q.22 (4)

Q.23 (3)

Q.24 (4)



Q.25 (1)

Adenine is a purine base common in both RNA and DNA

Q.26 (3)

Q.27 (1)

Q.28 (2)

Q.29 (1)

Q.30 (4)

Zinc ions hold six insulin molecule to make it as hexamer

Q.31 (2)

**JEE-MAIN
OBJECTIVE QUESTIONS**

Q.1 (3)

Q.2 (1)

Q.3 (1)

Q.4 (1)

Q.5 (C)

Q.6 (1)

Q.7 (3)

Q.8 (4)

The dipeptide is made of two amino acids they are alanine and glycine hence the name of dipeptide is alanylglycine. Hence

Q.9 (3)

The force of attraction between the neighbouring peptide chains is hydrogen bonding.

Q.10 (1)

Since in (1) the number of amino groups is more than that of carboxylic groups. Therefore it is basic.

Q.11 (2)

(1) – amino acid is that in which –NH₂ group is present at α – carbon.

Q.12 (3)

Q.13 (4)

Q.14 (2)

Q.15 (4)

Q.16 (4)

Q.17 (1)

Q.18 (4)

Q.19 (4)

Q.20 (3)

Q.21 (2)

Q.22 (1)

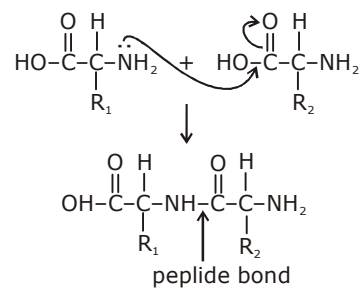
Q.23 (1)

Q.24 (4)

Q.25 (4)

Q.26 (3)

The peptide linkage



Q.27 (2)

Q.28 (3)

Q.29 (2)

Q.30 (3)

Q.31 (2)

Q.32 (2)

Q.33 (4)

Q.34 (3)

Q.35 (2)

Q.36 (4)

Q.37 (1)

Q.38 (4)

Q.39 (4)

Q.40 (4)

Q.41 (3)

Q.42 (3)

Q.43 (4)

Q.44 (2)

Q.45 (3)

Q.46 (1)

Q.47 (1)

Q.48 (4)

Q.49 (D)

Q.50 (2)

Q.51 (2)

Pentose sugar: Phosphoric acid, pyrimidines and purines

Q.52 (3)

Q.53 (2)

Q.54 (1)

Q.55 (4)

Q.56 (1)

Q.57 (2)

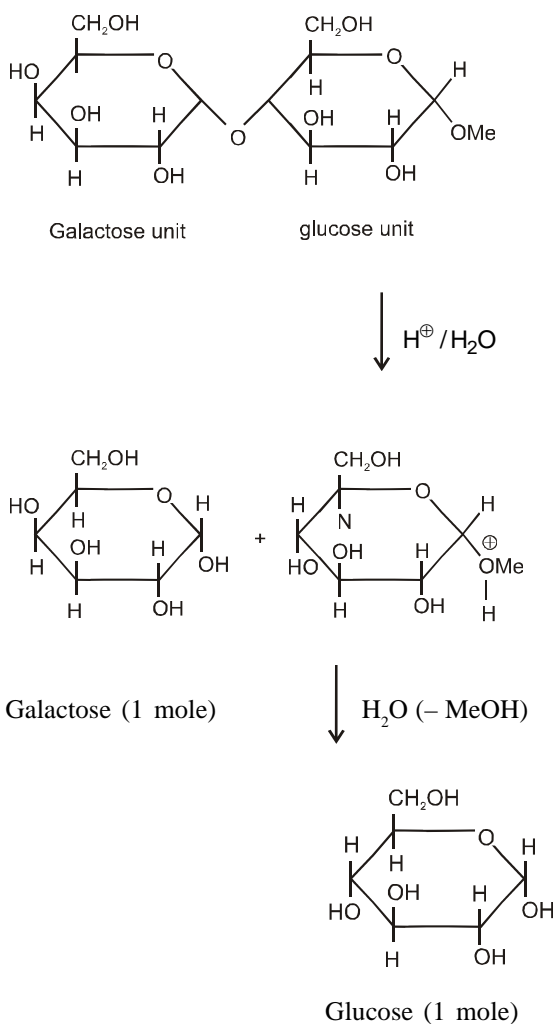
Q.58 (4)

- Q.59 (2)
 Q.60 (1)
 Q.61 (1)
 Q.62 (2)
 Q.63 (1)

**JEE-ADVANCED
 OBJECTIVE QUESTIONS**

- Q.1 (A)
 (A) is the Haworth projection of α -D-glucose it is also known as glucopyranose.

- Q.2 (D)



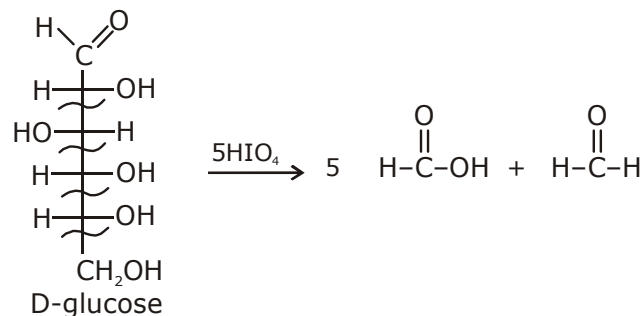
- Q.3 (B)
 Spontaneous change in the optical rotation of an optically active substance is known as mutarotation.
- Q.4 (B)
 Fructose reduces Fehling solution but sucrose does not.

- Q.5 (B)
 In osazone formation first phenyl hydrazine molecule forms hydrazone at C-1 second phenyl hydrazine molecule Oxidises the second carbon to carbonyl and third phenyl hydrazine molecule forms hydrazone with C-2.

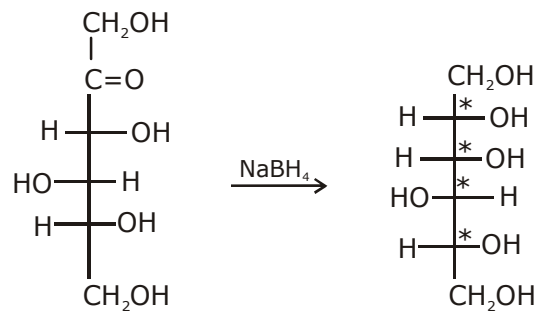
- Q.6 (C)
 Glucose shows mutarotation.

- Q.7 (D)
 In the formation of osazone C-1 and C-2 react with phenyl hydrazine to form phenyl hydrazone. If C-3, C-4, C-5 have same configuration the carbohydrates will form same osazone even if they differ in configuration at C-1 or C-2.

- Q.8 (B)



- Q.9 (B)

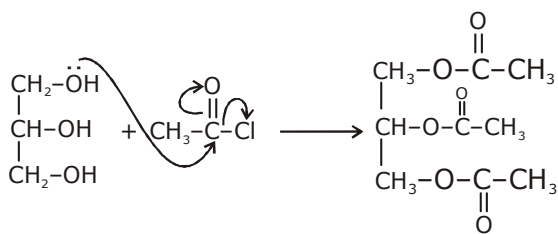


$$\text{T.S.I.} = 2^{n-1} + 2^{p-1}$$

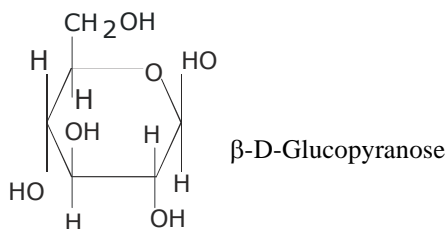
$$n=\text{even } P = \frac{n+1}{2}$$

T.S.I. = 10 (8+2) mese
 optical
 active

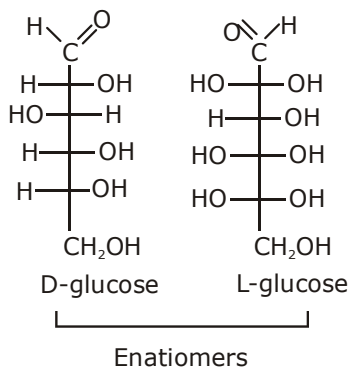
- Q.10 (A)



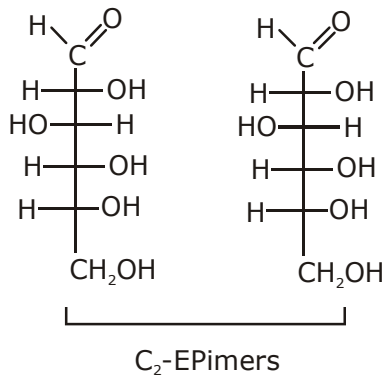
Q.11 (B)



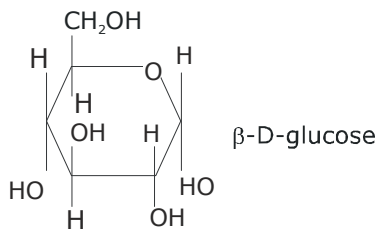
Q.12 (A)



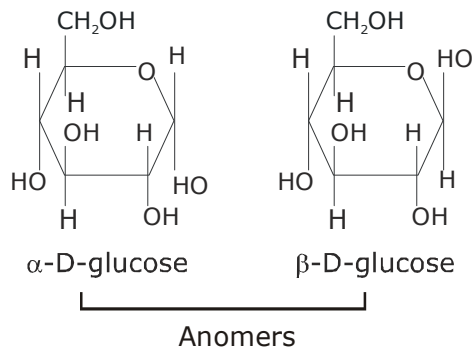
Q.13 (C)



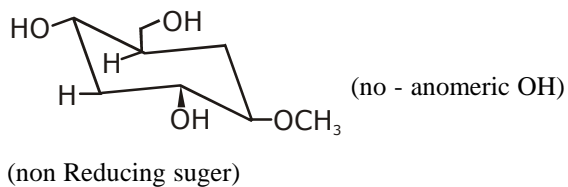
Q.14 (B)



Q.15 (B)



Q.16 (D)



Q.17 (C)

Oligosaccharides ⇒ 2–10 monosaccharide units are present.

Q.18 (C)

non reducing sugar
Sucrose (1,2-glycosidic linkage of α-glucose, β-D-fructose)

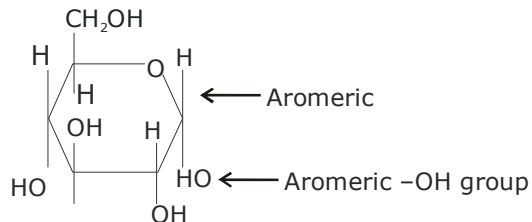
Q.19 (D)

Reducing sugar = fructose

Q.20 (C)

D-fructose ⇌ D glucose ⇌ α-D-glucose exist in 3 forms (Isomeric)

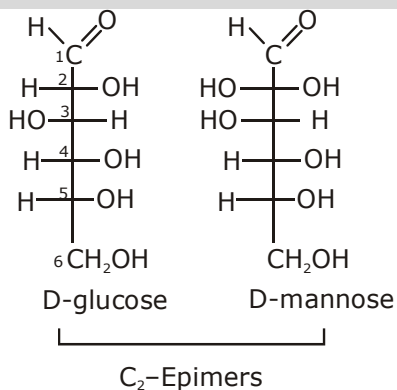
Q.21 (D)



Q.22 (D)

Sucrose – X (Anomeric -OH is absent)
Maltose
Lactose] ← Anomeric OH is present

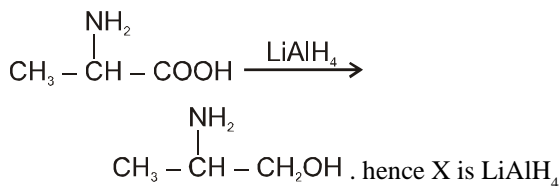
Q.23 (D)



- Q.24** (C)
 (A) Enantiomers (B) Functional Isomers
 (C) C-3 epimers (D) Diastereomer not epimers

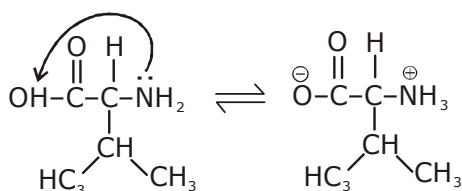
- Q.25** (B)
 Since proline has 2° amino group.

- Q.26** (C)



- Q.27** (B)
 Aspartame is an artificial sweetener, III is incorrect statement aspartame is an ester derivative of a dipeptide, made by aspartic acid and phenylalanine.

- Q.28** (B)



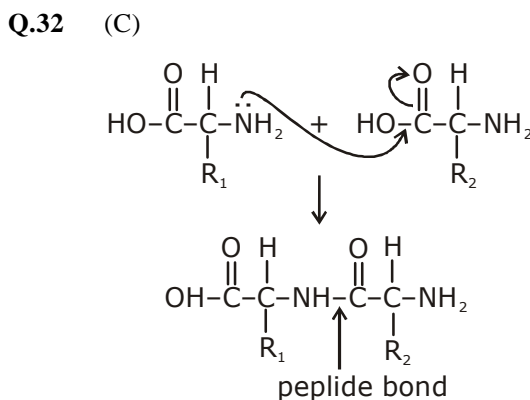
- Q.29** (A)
 pK_{a1} = 2.34
 pK_{a2} = 9.60

$$pI = \frac{pK_{a1} + pK_{a2}}{2} = \frac{2.34 + 9.60}{2} = \frac{11.94}{2} = 5.92$$

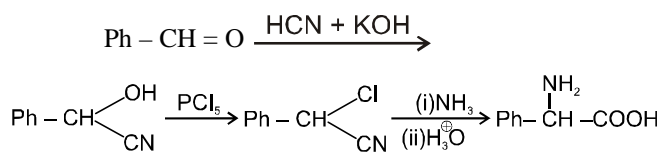
- Q.30** (D)
 Lactose → galactose and Glucose

- Q.31** (D)
- | | |
|--------------------|--------|
| Amino | Acid |
| ↓ | ↓ |
| NH ₂ gp | COOHgp |

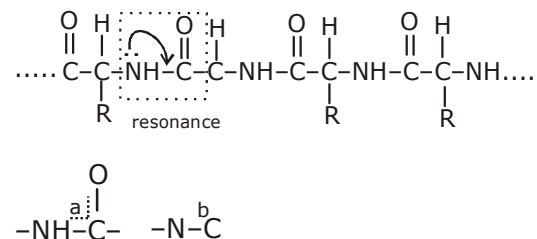
So compound in which -NH₂gp & -COOH gp both are present are known as amineacid.



- Q.33** (C)



- Q.34** (A)



- Q.35** (A)
 Starch is natural polymer of D-glucose

JEE-ADVANCED

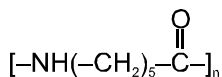
MCQ/COMPREHENSION/COLUMN MATCHING

- Q.1** (BCD)
 Starch is the mixture of two polysaccharides - Amylose and amylopectine
- Q.2** (B, D)
 I is L-sugar whereas II & III is D-sugar.
- Q.3** (ACD)
 6 membered ring with oxygen making a center is pyranose form.
- Q.4** (AC)
 A is α-D-mannose and C is β-D-mannose
- Q.5** (ABCD)
 Carbohydrate having different stereochemistry at C-1 are termed as Anomers, whereas when stereochemistry at any other carbon is different then those carbohydrates are known as epimers.

Q.6 (ABCD)

Q.7 (ABD)

Nylon-6 is a polyamide molecule.



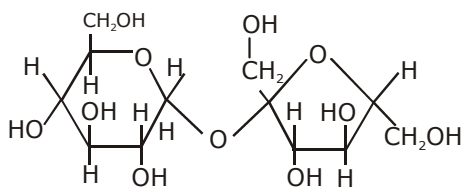
Q.8 (A,B,C)

Same Osazone

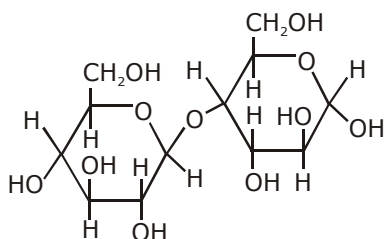
D-glucose
D-Mannose
D-fructose

same osazone

Q.9 (B,C)



(X) Non Reducing



(Y) Reducing

Q.10 (A,B,D)

positive Tollens – Anomeric –OH

Q.11 (CD)

Glucose shows mutarotation, sucrose gives glucose and fructose on hydrolysis.

Q.12 (AB)

Sucrose and lactose are disaccharides.

Comprehension # 1 (Q. No. 13 to 15)

Q.13 (A*)

Q.14 (C*)

Q.15 (B*)

13 P^{Ka_3} value of side chain determines the nature of amino acid

14 For acidic amino acid.

$$PI = \frac{PKa_1 + PKa_3}{2} = \frac{1.88 + 3.65}{2} = \frac{5.53}{2} = 2.77$$

15 For basic amino acids

$$PI = \frac{PKa_2 + PKa_3}{2} = \frac{8.95 + 10.53}{2} = \frac{19.48}{2} = 9.74$$

Comprehension # 2 (Q. No. 16 to 18)

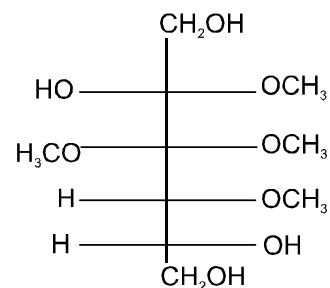
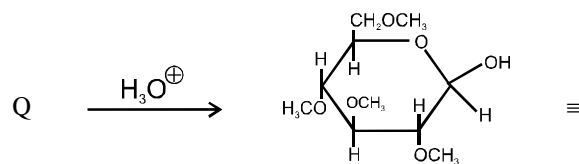
Q.16 (B*)

Q.17 (A*)

Q.18 (C*)

16 $C_6H_5CH_2-Br$ is highly reactive toward SN^2 in base, so all the –OH groups will be converted to OCH_2Ph groups.

17 Q is pentamethyl derivative, on hydrolysis only – OCH_3 of C – 1 (Part of acetal) will be converted to OH.



C-5 oxygen is involved in cyclic hemiacetal

18 TBDPSCl is regioselective for primary –OH groups in sugars

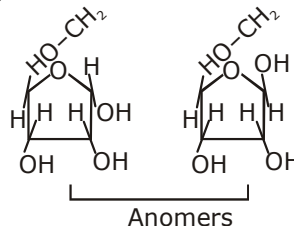
Comprehension # 3 (Q.19 to Q.21)

Q.19 (B)

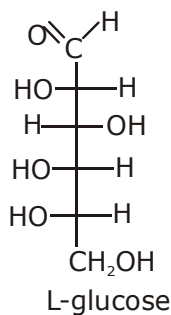
Q.20 (A)

Q.20 (D)

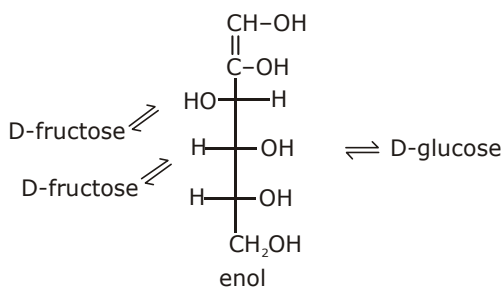
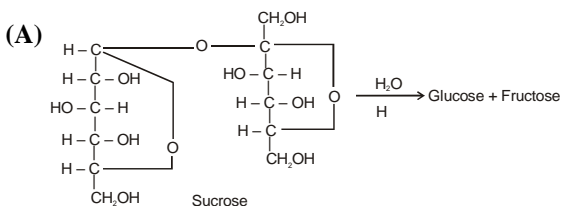
19



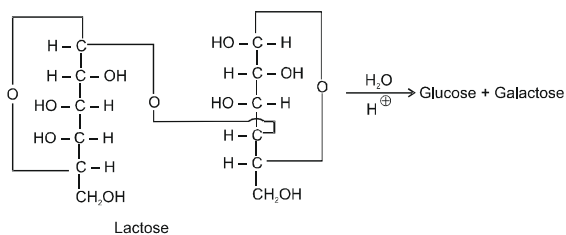
20



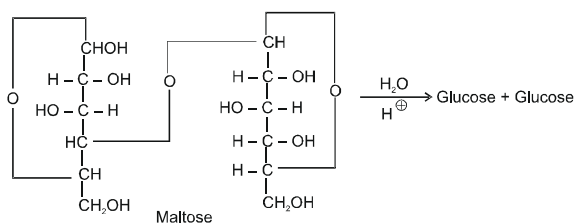
21


Q.22 (A) - q; (B) - r; (C) - p; (D) - p


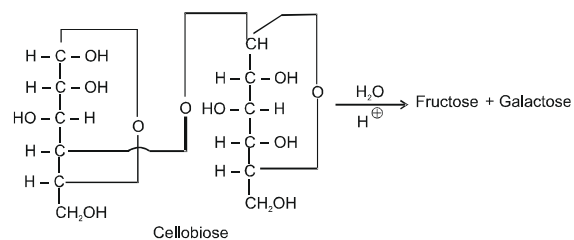
(B)



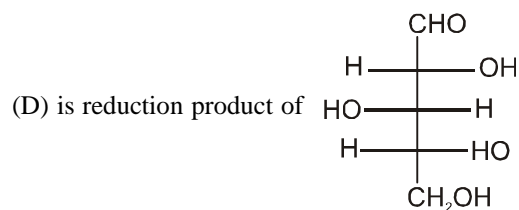
(C)



(D)


Q.23 (A) - q; (B) - p; (C) - s (D) - r

(A) has one acetal linkage thus is a disaccharide.
 (B) has one amide linkage.
 (C) has two amide linkages.


Q.24 (A) -p,q,r,s; (B) - p,q,r; (C) -T; (D) - p, r

Column-I
Column-II

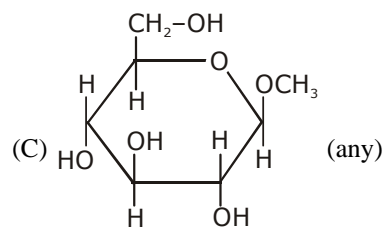
 (A) α -D-Glucose (P,Q,R,S)

(P) Undergoes osazone formation

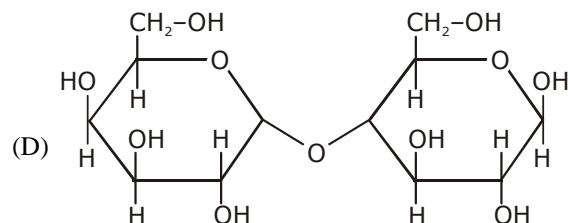
 (B) β -D-Glucose (P,Q,R,S)

(Q) On acetylation reaction with acetic

anhydride weight increase by 210



(R) It is reducing sugar


 (S) It is known as α -D-Glucopyranose

Q.25 (A) – p,s ; (B) – q,s ; (C) – r, s

NUMERICAL VALUE BASED

Q.1 [9]
(3)² = 9

Q.2 [9].

For each fragment of 400 unit = $\frac{4000}{400} = 10$ fragments

are obtained of 400 unit length.

So (10 – 1) = 9 glycosidic linkage cleaved.

Q.3 [3]
(i), (ii) and (iii) are true but (iv) is False because the glycosides are non-super impossible non-mirror images hence they are diastereomers.

Q.4 [3]
Molecular weight of octapeptide is 516 g/mole.
Total bonds to be hydrolysed (8 – 1) = 7.
Total weight of H₂O added = 7 × 18 = 126 gm/mole
Total weight of hydrolysed product = 126 + 516 = 642 gm.

Total weight of alanine in product = $\frac{642 \times 41.59}{100} =$

267 gm.

Molecular weight of alanine = 89 g/mole.

Number of alanine unit = $\frac{267}{89} = 3$.

Q.5 [4]

Q.6 [32]

$$pI = \frac{2.19 + 4.25}{2} = 3.22$$

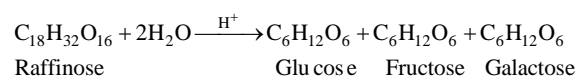
$$3.22 \times 10 = 32$$

Q.7 [16]

Q.8 [6]

$$pH_2 = \frac{pk_{a1} + pk_{a2}}{2} = \frac{2.34 + 9.66}{2} = 6$$

Q.9 [3]



Q.10 [4]
—CH(OH) + CH₃COCl → —

$CH-O-\overset{O}{\parallel}C-CH_3$ for every acetylation, molecular mass increases by 42 (12 + 16 + 14).

$$\therefore \text{number of } -OH \text{ groups} = \frac{318 - 150}{42} = 4$$

Q.11 4

$$pI = \frac{pKa(\beta) + pKa(\gamma)}{2}$$

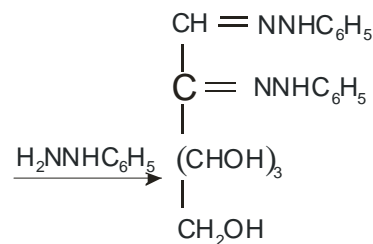
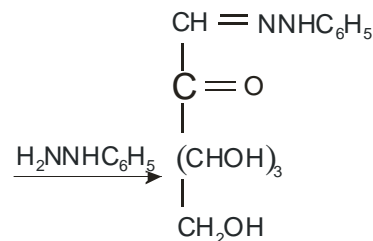
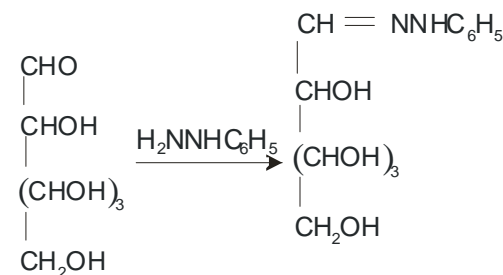
$$= \frac{-\log(10^{-5}) + -\log(10^{-3})}{2} = 4$$

Q.12 [2]

Q.13 [2]

Q.14 [6]

Q.15 [3]

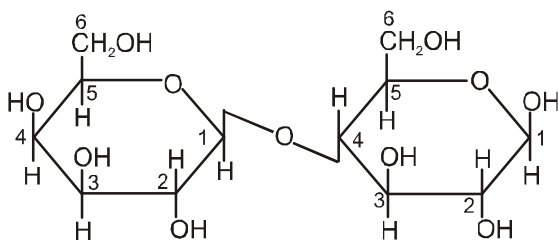
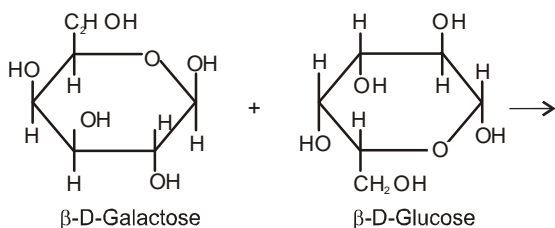


Q.16 [8]
It gives octa acetyl derivative

- Q.2** (4)
 (A) Sucrose – α -glucose and β -fructose
 (B) Lactose – β -galactose and β -glucose
 (C) Maltose – α -glucose and α -glucose

Q.3 (1)

Q.4 (1)



The linkage is between C-1 of Galactose and C-4 of Glucose.

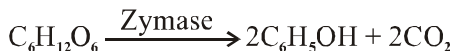
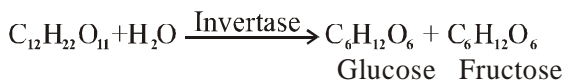
- Q.5** (1)
 Hydrogen bond is responsible for the stacking of α -helix structure of protein.

- Q.6** (4)

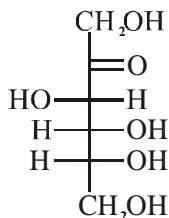
$$\text{Sucrose} \xrightarrow{\text{H}_2\text{O}} \text{glucose} + \text{Fructose}$$
 (Non reducing sugar) (Reducing sugar) (Reducing sugar)

Q.7 (3)
 Informative

OR



- Q.8** (2)
 Fructose is a ketohexose.



- Q.9** (3)
 The secondary structure of protein includes two type :
 (a) α -Helix (b) β -pleated sheet
 In α -Helix structure, the poly peptide chain is coil around due to presence of Intramolecular H-Bonding.

- Q.10** (1)
 Due to deficiency of Vitmain K causes increases in blood clotting time.

Note : Vitamin K related to blood factor.

- Q.11** (2)
 Vitamin-A & Vitamin-D

Q.12 (667)

Q.13 (1)

Q.14 (4)

Q.15 (4)

Q.16 (3)

Q.17 (3)

Q.18 (4)

Q.19 (4)

Q.20 (3)

Q.21 (4)

Q.22 (4)

Q.23 (2)

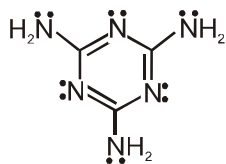
Q.24 (1)

- Q.25** (2)
 Keratin, collagen and myosin are example of fibrous protein.

Q.26 (3)

**JEE-ADVANCED
PREVIOUS YEAR'S**
Q.1 (6)

Structure of melamine is as follows



Total no. of lone pairs of electron is '6'.

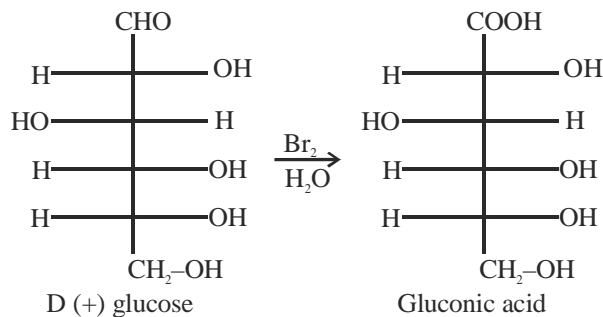
Q.2 (B, C)

 Specific rotation of D(+) glucose = $+52^\circ$

 Specific rotation of D(-) fructose = -92°

On adding equimolar mix of above two, the specific

 rotation of invert sugar is $\frac{+52 - 92}{2} = -20^\circ$
Q.3 (1,2,3,4)

 (1) **True:**

 (2) **TRUE** : Six member hemiacetal on anomeric carbon gives α -D glucose & β -D glucose.

 (3) **TRUE** : $C_{12}H_{22}O_{11} + H_2O \xrightarrow{\text{Invertase}} C_6H_{12}O_6 + C_6H_{12}O_6$
 Glucose Fructose

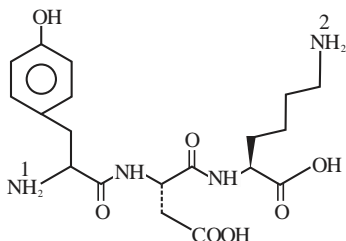
(+) (-)

 (4) **TRUE** : Monosaccharide cannot be hydrolysed to give polyhydroxy aldehydes and ketones

Q.4

(5)

$$|z_1| + |z_2| + |z_3| = 5$$


 At pH = 2 ¹NH₂ and ²NH₂ of Tyrosine and Lysine is +ve charged (+1 each)

$$+2 |z_1| = 2$$

 At pH = 6 NH₂ of Lysine (+1), COOH (-1) of glutamic acid, so because of dipolar ion exist $|z_2| = 0$

At pH = 11 COOH of Glutamic acid (-1) COOH of Lysine (-1) OH of phenol (-1)

$$|z_3| = 3$$

Polymer

EXERCISES

Elementary

Q.1 (1) It is present in the cell wall of plant.

Q.2 (4)

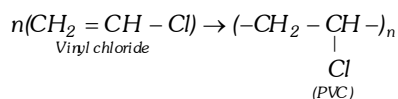
Q.3 (3)
Bakelite is thermosetting polymer. It becomes infusible on heating and can not be remoulded

Q.4 (2)
Nylon-66 is manufactured by the condensation polymerization of adipic acid and hexamethylenediamine with the loss of H_2O as steam.

Q.5 (2)

Q.6 (4)

Q.7 (2)



Q.8 (4)
Bakelite is a thermosetting plastic

Q.9 (3)

Q.10 (1)
Caprolactam is a monomer of nylon 6 (polycaprolactam)

Q.11 (1)

JEE-MAIN OBJECTIVE QUESTIONS

Q.1 (1)
Plexiglass is poly methyl methacrylate (PMMA) it is a homo polymer of methyl methacrylate

Q.2 (2)

Q.3 (1)

Q.4 (4)

Q.5 (2)

Q.6 (1)

Q.7 (1)
Starch is polymer of α - D - glucose.

Q.8 (3)
The monomer of Nylon - 66 are adipic acid and hexamethylene diamine.

Q.9 (1)
Nylon - 66 has amide linkage.

Q.10 (3)
Preparation of nylon - 66 is an example of condensation polymer, as it is formed by elimination of H_2O molecules from hexamethylenediamine and adipic acid.

Q.11 (3)
melamine is 2,4,6-triamino -1,3,5-triazine

Q.12 (3)

Q.13 (2)

Q.14 (4)

Q.15 (2)

Q.16 (1)

Q.17 (1)

Q.18 (3)

Q.19 (3)

Q.20 (1)

Q.21 (3)

Q.22 (3)
Ziegler Natta Catalyst is $Al_2(C_2H_5)_6 + TiCl_4$

Q.23 (2)

JEE-ADVANCED OBJECTIVE QUESTIONS

Q.1 (D)
Final product shown in the reaction is natural rubber (isoprene).

Q.2 (3)

Q.3 (2)

Buna-S is the co-polymer of buta-1,3-diene and styrene

Q.4 (1)

Q.5 (3)

Q.6 (2)

Q.7 (1)

Q.8 (3)

Q.9 (2)

Q.10 (1)

Q.11 (3)

Q.12 (1)

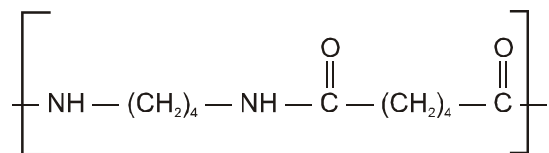
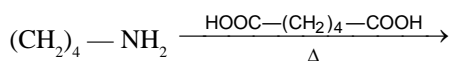
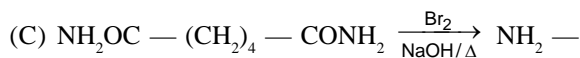
Novalac is a linear polymer of [Ph-OH + HCHO]. So ester linkage not present.
So novalac is not a polyester.

Q.13 (2)

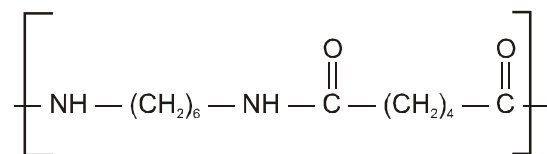
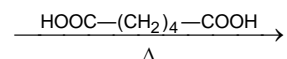
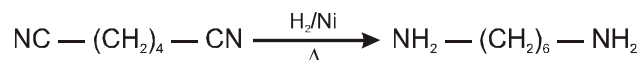
JEE-ADVANCED

PREVIOUS YEAR'S

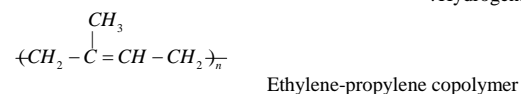
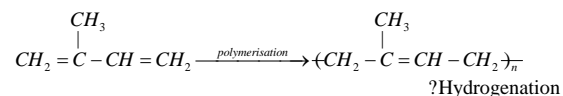
Q.1 (ABCD)



(D)



Q.2 (A)



Q.3 (B,D)

A. Natural rubber is polyisoprene containing cis alkene units

B. Nylon-6 has amide linkage $\left[\text{HN} - (\text{CH}_2)_5 - \overset{\text{O}}{\parallel}{\text{C}} \right]_n$

C. Cellulose has only β-D glucose units.


D. $\text{F}_2\text{C} = \text{CF}_2 \xrightarrow{\text{Persulphate}} [\text{CF}_2 - \text{CF}_2]_n$

Chemistry in Everyday Life

EXERCISES

JEE-MAIN

OBJECTIVE QUESTIONS

- Q.1 (3)
Q.2 (3)
Q.3 (1)
Q.4 (4)
Q.5 (3)
Q.6 (3)
Q.7 (2)
Q.8 (2)
Q.9 (1)
Q.10 (1)
Q.11 (1)
Q.12 (1)
Q.13 (1)
Q.14 (2)
Q.15 (3)
Q.16 (2)
Q.17 (3)
Q.18 (3)
Q.19 (4)
Q.20 (2)
Q.21 (4)
Q.22 (3)
Q.23 (4)
Q.24 (3)
- Q.25 (1)
Q.26 (2)
Q.27 (1)
Q.28 (2)
Q.29 (1)
Q.30 (1)
Q.31 (1)
Q.32 (2)
Q.33 (4)
Q.34 (1)
Q.35 (3)
Q.36 (1)
Q.37 (2)
Soaps are sodium salts of long chain fatty carboxylic acids e.g. sodium oleate $C_{17}H_{33}COO^- Na^+$ Similarly sodium stearate is a soap of a saturated fatty acid $C_{17}H_{35}COOH$. Sodium palmitate is $C_{15}H_{31}COOH$. Soaps form micelle in which there is one hydrophobic part and another is hydrophilic part
- 
- Hydrophobic part
- Hydrophilic part
- Q.38 (4)
The incorrect statement is, "soaps work more efficiently in hard water than in soft water. Soaps actually do not give foams in hard water due to formation of insoluble salts like calcium stearate and magnesium stearate with hard water containing impurities of Ca & Mg carbonates and bicarbonates.
- Q.39 (4)
The incorrect statement is that LABS detergents are not biodegradable. Actually all detergent are not biodegradable and they cause pollution and hazardous to human civilization.

- Q.40** (4)
The incorrect statement about detergent is that, fluorescers are the organic compounds which act as foaming agents. Actually fluorescers are optically whitening agents which cause the clothes white and impart whitening in it. These are also known as fluorescent brighteners. They are stilbene derivatives.

- Q.41** (4)
All statements are true.

JEE-ADVANCED**MATCHING**

- Q.1** (A - q), (B - s), (C - r), (D - p)

- Q.2** (A-r), (B- s), (C- p), (D-q)

KVPY**PREVIOUS YEAR'S**

- Q.1** (C)

- Q.2** (D)
Cetyltrimethyl ammonium bromide is used for sanitizing agent.

JEE-MAIN**PREVIOUS YEAR'S**

- Q.1** $a \rightarrow r$; $b \rightarrow q$; $c \rightarrow s$; $d \rightarrow p$
(a) Valium (iv) Tranquilizer
(b) Morphine (iii) Analgesic
(c) Norethindrone (i) Antifertility drug
(d) Vitamin B12 (ii) Pernicious anemia

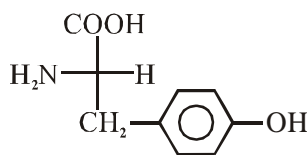
- Q.2** (1)

- Q.3** (3)
(A) Antifertility drug \rightarrow (iii) Nor ethindrone
(B) Antibiotic \rightarrow (iv) Salvarsan
(C) Tranquilizer \rightarrow (i) Meprobamate
(D) Artificial sweetener \rightarrow (ii) Alitame
A-iii, B-iv, C-i, D-ii

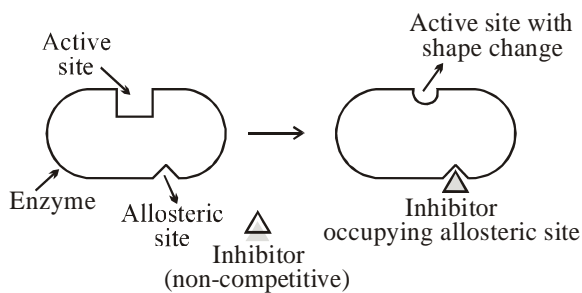
- Q.4** (1)
(a) Antacid : Cimetidine
(b) Artificial Sweetener : Alitame
(c) Antifertility : Novestrol
(d) Tranquilizers : Valium

- Q.5** (2)
Artificial sweetner : Sucralose
Antiseptic : Bithional
Preservative : Sodium Benzoate
Glyceryl ester of stearic acid : Synthetic detergent

- Q.6** (4)
The structure of Tyrosine amino acid is



- Q.7** (3)
Some drug do not bind to the Enzyme's active site. These bind to a different site of enzyme which called **allosteric site**. This binding of inhibitor at allosteric site changes the shape of the active site in such a way that substrate can not recognise it. Such inhibitor is known as **Non-competitive inhibitor**.



- Q.8** (2)

- Q.9** (1)

- Q.10** (3)

- Q.11** (4)

- Q.12** (2)

- Q.13** (3)

- Q.14** (4)

- Q.15** (2)