Haloalkanes and Haloarenes

EXERCISE-I (MHT CET LEVEL)

Q.1 (4)

Q.2 (1)

Q.3 (3)

Q.4 **(1)**

Q.5 (4)

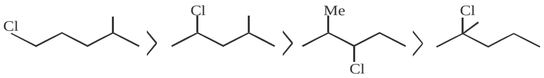
In S_{N^2} reaction the nucleophile always attack from back side therefore a single stereoisomer is formed with inverted configuration.

Q.6 (1)

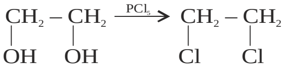
Sn^2 mechanism gives inversion of configuration always.

Q.7 (1)

Rate of Reaction for $S_{n^2} \propto \frac{1}{\text{Steric hindrance}}$



Q.8 (1)

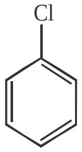


$$\underset{OH}{CH_2} - \underset{OH}{CH_2} \xrightarrow{PCl_5} \underset{Cl}{CH_2} - \underset{Cl}{CH_2}$$

ethylene chloride

Q.9 (3)

$$R - X + AgNO_3 \rightarrow R^{\oplus}NO_3^{\ominus} + AgX \downarrow$$



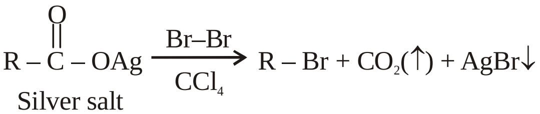
Does not give white ppt with $AgNO_3$ Due to partial double bond character in C-Cl bond because of resonance.

Q.10 (1)

Lesser number of carbon atom lesser will boiling point more will volatile character

Q.11 (2)

Borodiene-Hunsdiecker's reaction



$$R - \overset{O}{\overset{\|}{C}} - OAg \xrightarrow[CCl_4]{Br-Br} R - Br + CO_2(\uparrow) + AgBr\downarrow$$

Silver salt
of carboxylic acid

Q.12 (2)

S_N2 mechanism is a single step concerted process and proceed through transition state.

Q.13 (2)

For Sn^2

$r = K[R-X][B^0]$

$r' = K[2R-X][2B^-]$

$r' = 4K[R-X][B^-]$

$r' = 4r$

Q.14 (3)

The more is the stability of intermediate carbonium ion the more is the chance of S_N1 mechanism. The intermediates obtained will be,

$$Ph\overset{+}{C}H_2(i), Ph\overset{+}{C}H - Me(ii),$$

$$Ph\overset{+}{C}Me_2(iii), Ph\overset{+}{C}MePh(iv)$$

The stability is of the order iv > iii>ii>i.

Q.15 (4)

Q.16 (1)

Q.17 **(4)**

Q.18 **(2)**

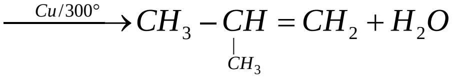
Q.19 **(2)**

Q.20 **(2)**

Q.21 **(1)**

Q.22 (3)

$$Me_3CCl \xrightarrow{KOH} \underset{tert.alcohol}{Me_3COH}$$



$$\xrightarrow{Cu/300°} CH_3 - \underset{CH_3}{\underset{|}{CH}} = CH_2 + H_2O$$

or

$Me_2C=CH_2$

(3)

Q.23 **(2)**

Q.24 **(1)**

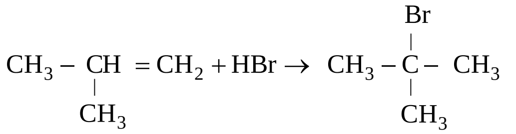
Q.25 **(4)**

EXERCISE-II (NEET LEVEL)

Q.1 (4)

Because I^- is a good Nu^-

Q.2 (4)



$$CH_3-\underset{\underset{CH_3}{|}}{CH}=CH_2+HBr \rightarrow CH_3-\overset{\overset{Br}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_3$$

2-bromo, -2-methyl propane

Q.3 (1)

$$C_3H_8+Cl_2 \xrightarrow{\text{Light}} C_3H_7Cl+HCl$$

This is an example of substitution reaction. Hydrogen atom of alkane is replaced by halogen atom.

Q.4 (3)

$CH_3–CH=CH_2+HBr \xrightarrow{\text{Peroxide}} CH_3-CH_2-CH_2-Br$

Addition of HBr with Anti marbnoihoff rule

Q.5 (1)

The chlorination of alcohol by $SOCl_2$ (thionyl chloride) is the best method for the preparation of alkyl halides as in this method all the other product are gaseous and thus halides are obtained on quite pure state

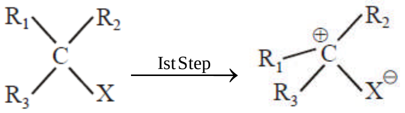
$$R-OH+SOCl_2 \xrightarrow{\Delta} R-Cl+HCl\uparrow+SO_2\uparrow$$

Q.6 (2)

$$RX+Mg \xrightarrow[\text{ether}]{\text{Dry}} \underset{\text{Grignard's reagent}}{R-Mg-X} \quad (X=Cl, Br, I)$$

Q.7 (1)

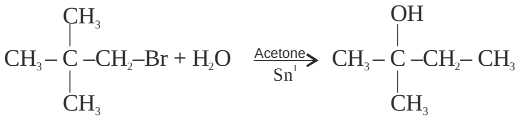
Q.8 (3)



carbocation

Q.9 (3)

Q.10 (2)



$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_2-Br+H_2O \xrightarrow[Sn^1]{\text{Acetone}} CH_3-\overset{\overset{OH}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH_2-CH_3$$

This substrate gives Sn^1 mechanism because at the β - carbon high steric hindrance is present.

Q.11 (4)

$$\xleftarrow[\substack{\text{high.M.w.}\\ \text{high D}}]{RI>RBr>RCl>RF} \qquad \xrightarrow{R-F>R-Cl>R-Br>RI}$$

$$\downarrow$$

(R – F)

high bond energy, high stability

Q.12 (1)

For Sn^2

Rate of reaction $\propto [Rx][Nu^\ominus]$

Q.13 (1)

$$C_2H_5Br \xrightarrow{KCN(X)} C_2H_5CN \xrightarrow{LiAlH_4(Y)}$$

$$C_2H_5CH_2NH_2(C_3H_7NH_2)$$

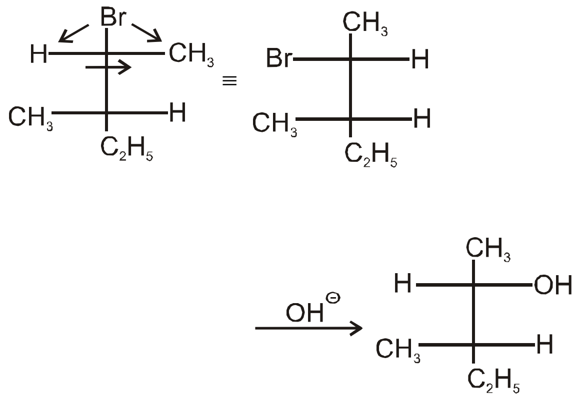
$$X=KCN, Y=LiAlH_4$$

Q.14 (2)

$$CH_3Br+AgCN \xrightarrow{\text{alcohol}} CH_3-N\equiv C$$

Q.15 (4)

Q.16 **(2)**



Q.17 (1)

$$CH_2=CHCl<CH_3CH_2CH_2Cl<CH_2=CH-CH_2Cl$$

$$CH_2=\overset{\oplus}{CH}<CH_3CH_2\overset{\oplus}{CH_2}<CH_2=CH-\overset{\oplus}{CH_2}$$

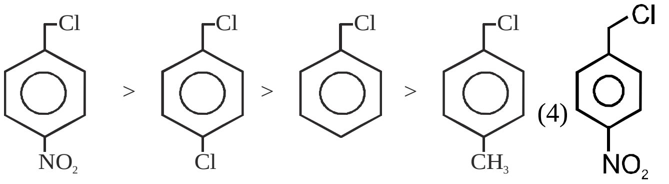
$$\xrightarrow{\hspace{15em}}$$

Stability of carbocation

Q.18 (4)

$$\mathrm{R-x + Nu^{\ominus} \xrightarrow[Sn^2]{} R-Nu + x^{\ominus}}$$

If electropositive character will increase at the electrophilic carbon of R group then $Nu^{\odot}$ will attack with greater speed and rate of reaction will increases. So reactivity order



Q.19 (3)

$C_2H_5ONa + BrC_2H_5 \rightarrow C_2H_5–O–C_2H_5 + NaBr$

Williamson's synthesis

Q.20 (3)

Alkyl halide react with sodium metal in dry ether is called Wurtz reaction.

Q.21 (4)

$$CH_3 - C \equiv CH \xrightarrow{Na} CH_3 - C \equiv C^{-}Na^{+}$$

$$\xrightarrow{CH_3-CH_2-I} CH_3 - C \equiv C - CH_2 - CH_3$$

Q.22 (2)

$CH_2 = CH – Cl$ is less reactive due to double bond characterstic in C - Cl bond because of resonance stabilisation.

Q.23 (1)

$CH_2{=}CH–CH_2–Cl > CH_3–CH_2–CH_2–Cl > CH_3–CH{=}CH–Cl$

Q.24 (2)

$$CH_3-CH_2-CH_2-O-CH_3 \xrightarrow{\text{HCl (1eq)}} CH_3-CH_2-CH_2-OH + CH_3-Cl$$

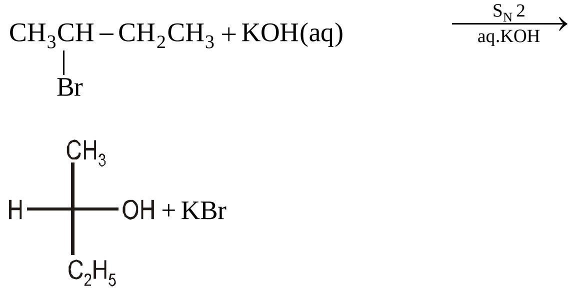
Q.25 (1)

$$\mathrm{R-x + Na\overset{\ominus}{O}H \longrightarrow R-OH + NaX}$$

–X group is substituted by O

Q.26 (3)

Q.27 (1)



$$\underset{\displaystyle\mathrm{Br}}{\mathrm{CH_3CH}}-CH_2CH_3 + KOH(aq) \xrightarrow[\text{aq.KOH}]{S_N2}$$

+ KBr

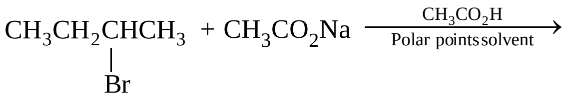
Q.28 (1)

$$\underset{\text{Chloroform}}{CHCl_3} \xrightarrow[\text{light of sun}]{\text{Air}} \underset{\text{Phosgene}}{COCl_2}$$

$$\underset{\text{DyksjkeZ}}{CHCl_3} \xrightarrow[\text{lw;Zdk izdk'k}]{\text{ok;q}} \underset{\text{QkWLth}}{COCl_2}$$

Q.29 (3)

Q.30 (3)



$$\underset{\displaystyle\mathrm{Br}}{CH_3CH_2CHCH_3} + CH_3CO_2Na \xrightarrow[\text{Polar points solvent}]{CH_3CO_2H}$$

S_N2

Q.31 (4)

Q.32 (4)

The alkyl halides are highly reactive, the order of reactivity is

Iodide > bromide > chloride > (nature of the halogen atom).

Tertiary > secondary > primary.

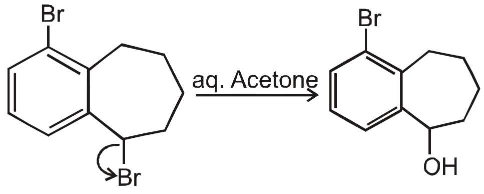
Thus 2-bromopropane is the given option.

Q.33 (1)

SN^2 Substitution nucleophilic bimolecular order of different alkyl halides. $1^o > 2^o > 3^o$

SN^1 Substitution nucleophilic unimolecular order of different alkyl halides, $3^o > 2^o > 1^o$.

Q.34 (1)



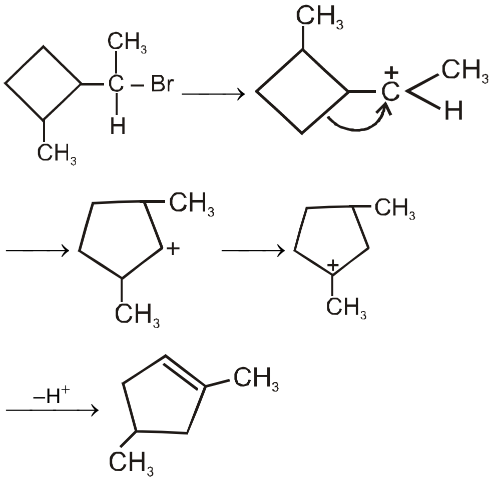
In aryl halides the C–X bond has partial double bond character due to resonance so it will not give S_N1 reaction.

Q.35 (1)

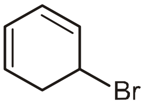
Only 1° alkyl halides, *i.e.* CH_3Br undergoes S_N2 reaction.

Q.36 (2)

Q.37 (3)

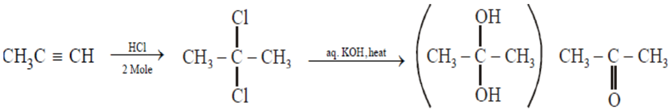


Q.38 (1)


give benzene on elimination which is aromatic in nature.

Q.39 (1) But-2-ene is saytzeff's alkene.

Q.40 (2)



$$CH_3C\equiv CH \xrightarrow[\text{2 Mole}]{\text{HCl}} CH_3-\overset{Cl}{\underset{Cl}{C}}-CH_3 \xrightarrow{\text{aq. KOH, heat}} \left(CH_3-\overset{OH}{\underset{OH}{C}}-CH_3\right)\ CH_3-\underset{\|\atop O}{C}-CH_3$$

Q.41 (2)

Q.42 (4)

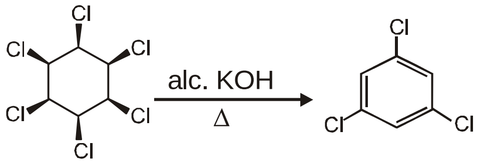
We know that

$$\underset{\text{chloroform}}{HCCl_3}+6Ag+\underset{\text{chloroform}}{Cl_3CH}\xrightarrow{\text{heat}}\underset{\text{Acetylene}}{HC\equiv CH}+6AgCl$$

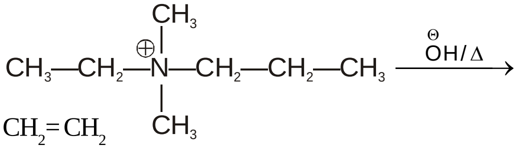
Thus in this reaction acetylene $(HC\equiv CH)$ is produced.

Q.43 (2)

Q.44 (2)



Q.45 (2)



$$CH_3-CH_2-\overset{CH_3}{\underset{CH_3}{\overset{\oplus}{N}}}-CH_2-CH_2-CH_3\xrightarrow{\overset{\ominus}{O}H/\Delta} CH_2=CH_2$$

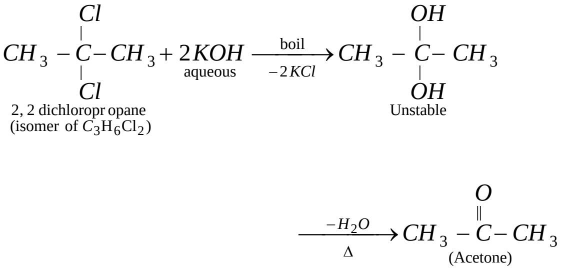
Q.46 (4)

All can give E1 cB reaction.

All the three have more acdic β–Hydrogen so in presence of strong base give product through E1cB reaction.

Q.47 (3)

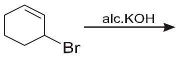
Q.48 (1)



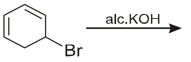
$$\underset{\substack{\text{2, 2 dichloropr opane}\\ \text{(isomer of } C_3H_6Cl_2)}}{CH_3-\overset{Cl}{\underset{Cl}{C}}-CH_3}+2\underset{\text{aqueous}}{KOH}\xrightarrow[-2KCl]{\text{boil}}\underset{\text{Unstable}}{CH_3-\overset{OH}{\underset{OH}{C}}-CH_3}$$

$$\xrightarrow[\Delta]{-H_2O}\underset{\text{(Acetone)}}{CH_3-\overset{O}{\overset{\|}{C}}-CH_3}$$

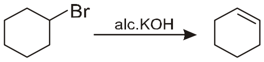
Q.49 (1)



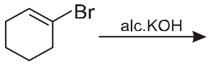
Stable by resonance and hyperconjugation

(2) 

More stable product due to resonance of 6πe⁻

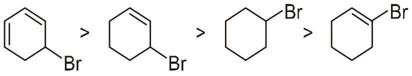
(3) 

Stable by only hyperconjugation

(4) 

No reaction

∴ Rate of de-bromination is



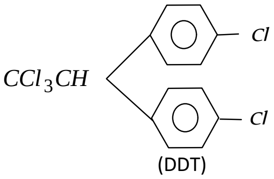
Q.50 (1)

Q.51 (1)

Carbocation of (1) is CPM which is most stable carbocation.

Q.52 (1)

Q.53 (1)



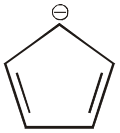
(DDT)

Q.54 (1)

$(CH_3)_3COH + PhMgBr \longrightarrow PhH + (CH_3)_3COMgBr$

Q.55 (1)

Q.56 (3)



$6\pi e$ are present in compound

Q.57 (4)

In benzene all C–C bond lengths are same.

Q.58 (2)

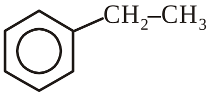
10.5 gram carbon Per hydrogen

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

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

C_7H_8

Q.59 (3)



Benzylic carbon has 2 hydrogen

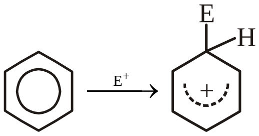
ethyl benzene.

Q.60 (2)

$-CCl_3, -NO_2, -CHO \longrightarrow$ Meta directing group

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

Q.61 (4)



$\Rightarrow \sigma$ complex wheland intermediate benzenium cation.

Q.62 (4)

Q.63 (4)

CH_3 group in toluene is o, p-position direction activator.

EXERCISE-III (JEE MAIN LEVEL)

Q.1 (1)

Due to dipole-dipole interaction the boiling point of alkyl halide is higher as compared to correseponding alkanes.

Q.2 (4)

Finkelstein Reaction - It is also known as halogen exchange reaction

$$R-Br / R-Cl + KI \xrightarrow{\text{Acetone}} R–I + KBr/KCl$$

Q.3 (1)

Q.4 (2)

Q.5 (4)

R–Br & R – I cannot not prepared by Darzen reaction because $SOBr_2$ and SOI_2 are unstable.

Q.6 (2)

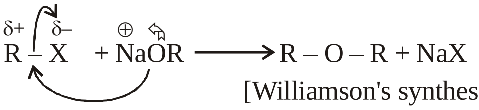
Q.7 (3)

Q.8 (3)

Q.9 (3)

Q.10 (1)

Q.11 (1)



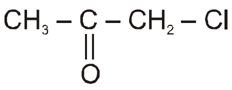
$$\overset{\delta+}{R} - \overset{\delta-}{X} + Na\overset{\oplus}{O}R \longrightarrow R-O-R + NaX$$

[Williamson's synthesis]

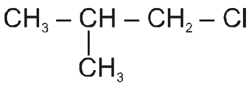
Q.12 (2)

Q.13 (1)

Q.14 (3)



$CH_3-\underset{\underset{O}{\|}}{C}-CH_2-Cl > CH_3-Cl > CH_3-CH_2-Cl >$



$CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-Cl$

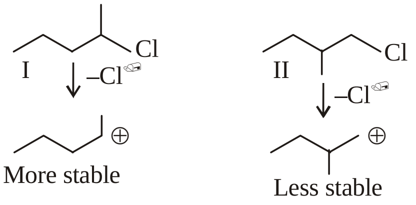
Q.15 (2)

Q.16 (3)

Intermediate carbocation of ‘C’ is more stable than, A, B, D compound.

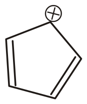
Q.17 (3)

Reactivity of alkyl halide increases with increase of stability of intermediate carbocation. Stability of carbocation of I is more than II only in ‘C’ option due to more hyperconjugation



Q.18 (3)

S_{N^1} Reaction intermediate (carbocation) of compound–C is unstable due to anti-aromaticity.



Antiaromatic
(Unstable)
Carbocation

Q.19 (1)

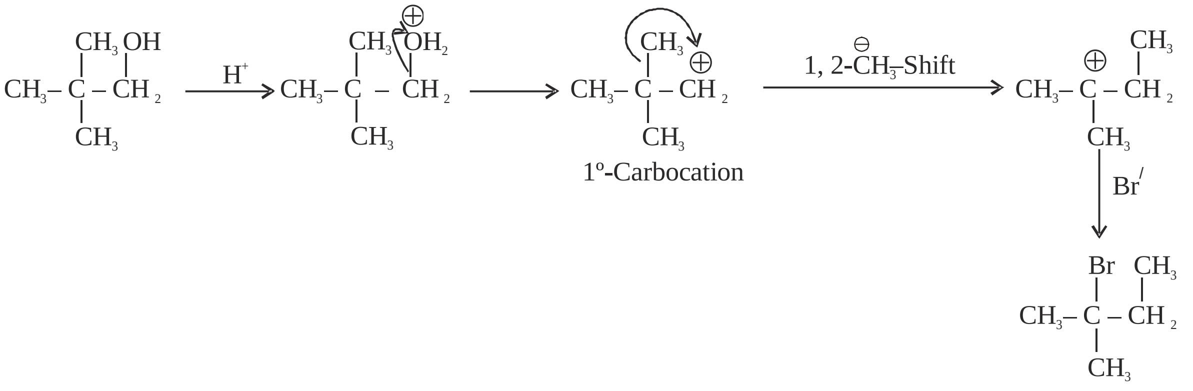
Q.20 (2)

T.S. of compound ‘B’ is more stable than other.

Q.21 (3)

Due to resonance stablisation of carbocation compound show SN^1 – mechanism, due to less steric hindrance around α-carbon it also show SN^2 mechanism.

Q.22 (3)



(Rearrange product)

Q.23 (2)

Q.24 (3)

Reaction intermediate carbocation of compound ‘C’ is most stable than carbocation of other molecules.

Q.25 (2)

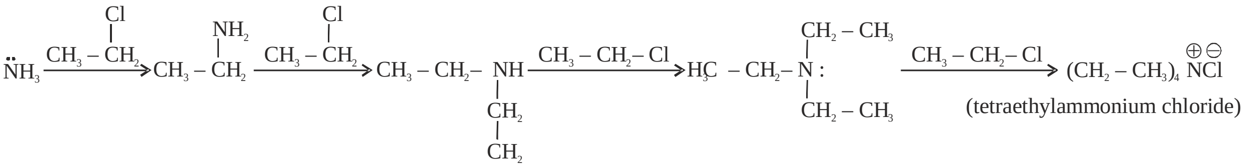
Reaction intermediate carbocation of compound ‘C’ is more stable than carbocation of other molecules

Q.26 (1)

Alkyl halide having tendency to form more stable carbocation will have more tendency to show SN reaction by SN^1– Mechanism stability order of carbocation of compound II > III > IV > I due to hyperconjugation.

Q.27 (4)

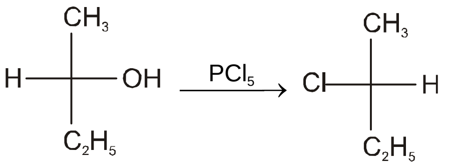
Q.28 (4)



$\ddot{N}H_3 \xrightarrow{CH_3-\overset{Cl}{CH_2}} CH_3-\overset{NH_2}{CH_2} \xrightarrow{CH_3-\overset{Cl}{CH_2}} CH_3-CH_2-\underset{\underset{CH_2}{CH_2}}{NH} \xrightarrow{CH_3-CH_2-Cl} H_3C-CH_2-\overset{CH_2-CH_3}{\underset{CH_2-CH_3}{N:}} \xrightarrow{CH_3-CH_2-Cl} (CH_2-CH_3)_4\overset{\oplus\ominus}{NCl}$

(tetraethylammonium chloride)

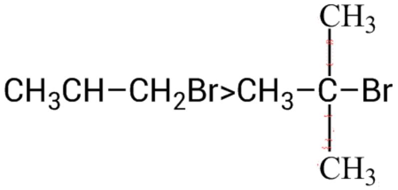
Q.29 (2)



Product is R - 2- Chlorobutane

Q.30 (2) S_N2 mechanism is followed in case of and secondary halides i.e., S_N2 primary and secontany small groups on the carbon atom attached to halogens so

$CH_3CH_2Br > CH_3CH_2CH_2Br >$



$CH_3CH-CH_2Br > CH_3-\overset{CH_3}{\underset{CH_3}{C}}-Br$

Q.31 (3)

Q.32 (1)

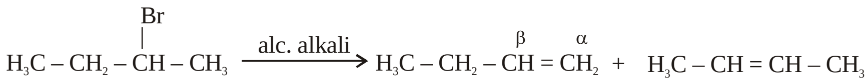
Q.33 (3)

Q.34 **(4)**

Q.35 **(4)**

Q.36 **(4)**

Q.37 (4)



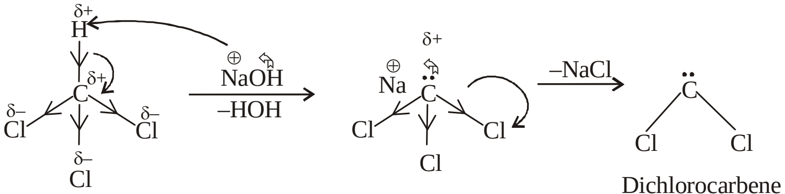
$H_3C-CH_2-\overset{Br}{CH}-CH_3 \xrightarrow{\text{alc. alkali}} H_3C-CH_2-\overset{\beta}{CH}=\overset{\alpha}{CH_2} + H_3C-CH=CH-CH_3$

[Reaction occure by Saytzeff's Rule]

α-Butylene (20%)

β-Butylene (80%)

Q.38 (2)

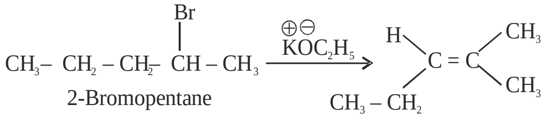


α-elimination reaction

Dichlorocarbene

Q.39 (1)

Sol.



The above elimination anti-elimination process.

Q.40 (4)

Q.41 (3)

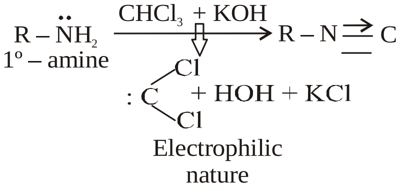
Q.42 (1)

Q.43 (3)

Q.44 (1)

Q.45 (3)

Q.46 (1)



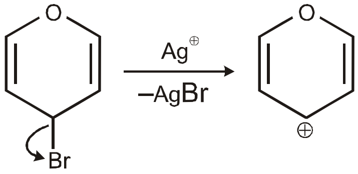
[Carbylamine reaction (Isocyanide test)]

Q.47 (2)

Q.48 (1)

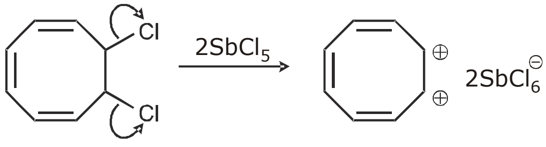
Q.49 (1)

Q.50 (2)



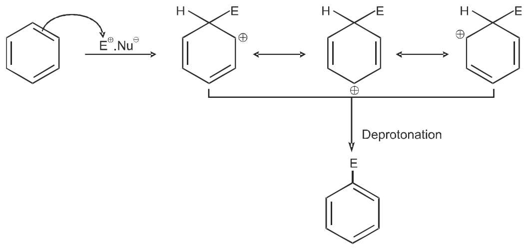
(Quasi Aromatic Compound)

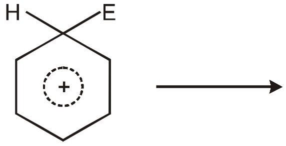
Q.51 (2)



(Quasi Aromatic Compound)

Q.52 (4)





Arenium ion / σ-complex /

Wheeland inter Mediate

Q.53 (2)

Anhydrous $AlCl_3$ ____ is best reagent for friedel craft Halogenation.

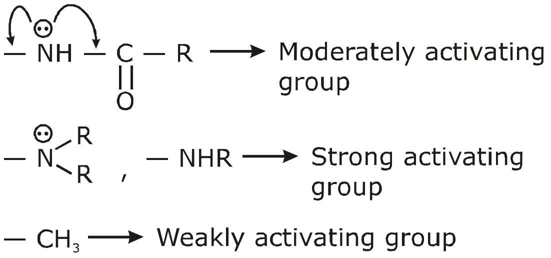
Q.54 (3)

Reactivity towards electrophile ∝ Electron releasing group.

Q.55 (4)

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

Q.56 (2)



EXERCISE-IV

Q.1 (6)

no rearrangement

a,c,d,f,g,h show rearrangement

Q.2 2

Q.3 75

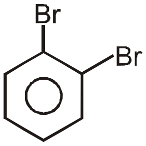
Nucleophiles : (ii), (iv), (v), (vii), (x)

Electrophiles : (i) , (iii), (vi), (viii), (ix), (xi), (xii)

Q.4 4

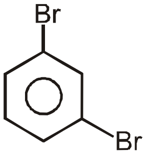
The electron pair at position (4) is not delocalised other are delocalised, hence position 4 is strongest nucleophile.

Q.5 23



$\xrightarrow{NO_2^{\oplus}}$ two mononitro products

(1, 2)



$\xrightarrow{NO_2^{\oplus}}$ three mononitro products

(1, 3)

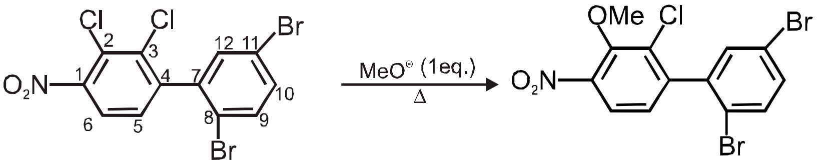
Q.6 15

Rate of $S_N2 \propto [R-X][Nu^-]$

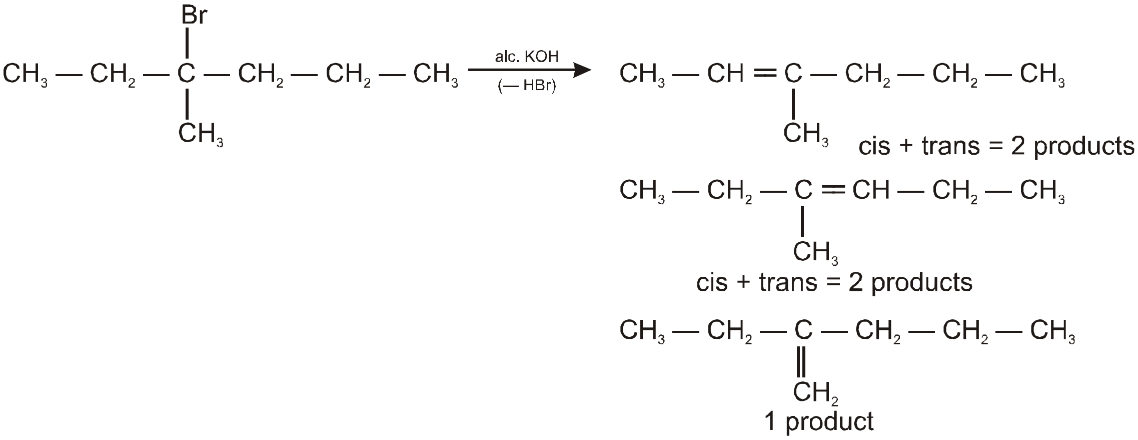
$$\frac{r_2}{r_1} = \frac{[3RX]\left[\frac{1}{2}OH^-\right]}{[RX]\,[OH^-]}$$

$$r_2 = 1.5\,r_1$$

Q.7 2



Q.8 5



$$CH_3-CH_2-\underset{\substack{|\\ CH_3}}{\overset{\substack{Br\\ |}}{C}}-CH_2-CH_2-CH_3 \xrightarrow[(-\,HBr)]{alc.\ KOH} CH_3-CH=\underset{\substack{|\\ CH_3}}{C}-CH_2-CH_2-CH_3$$

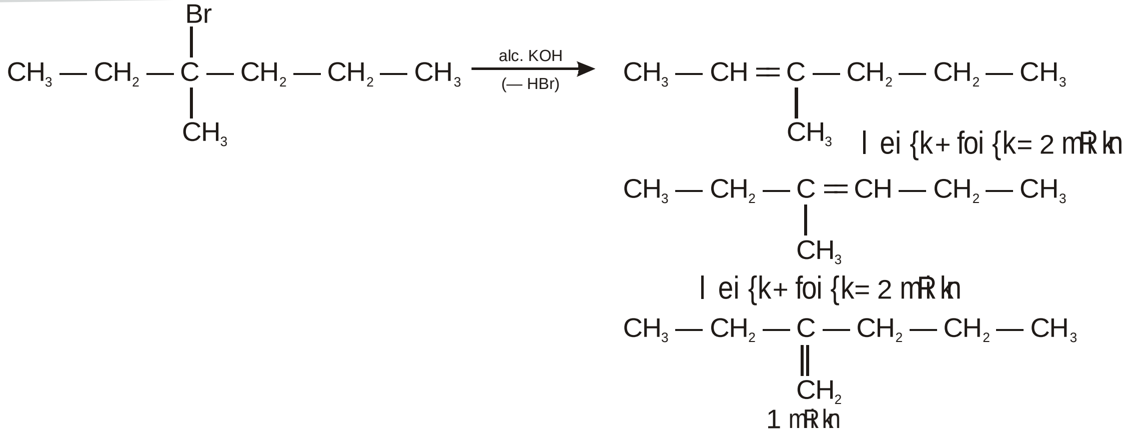
cis + trans = 2 products

$$CH_3-CH_2-\underset{\substack{|\\ CH_3}}{C}=CH-CH_2-CH_3$$

cis + trans = 2 products

$$CH_3-CH_2-\underset{\substack{\|\\ CH_2}}{C}-CH_2-CH_2-CH_3$$

1 product



Q.9 **3**

Q.10 **3**

MHT

Q.1 (1)

Q.2 (1)

Q.3 (3)

Q.4 (3)

Q.5 (1)

Q.6 (4)

Q.7 (2)

Q.8 (3)

Q.9 (4)

Q.10 (4)

Q.11 (2)

Q.12 (2)

Q.13 (1)

Q.14 (2)

Q.15 (3)

Q.16 (3)

Q.17 (4)

Q.18 (1)

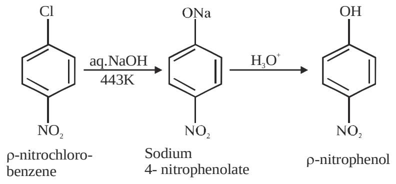
Q.19 (1)

Q.20 (4)

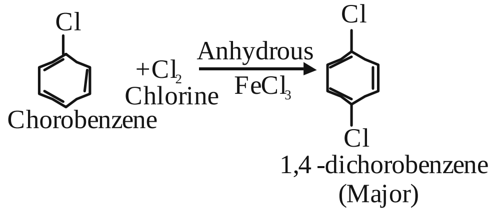
Q.21 (3)

Q.22 (4)

Q.23 (3)



Q.24 (3)
1, 4- dichlorobenzene



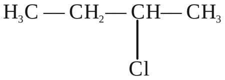
Q.25 (4)
in the Wurtz reaction alkyl halides react with sodium in dry ether to given hydrocarbon contain duuble the number carbon atoms presntin the halide

$$\underset{\text{tert}-\text{butyl bromide}}{2(CH_3)_3CBR} \xrightarrow{\text{Na / Dry ether}}$$

$$\underset{\text{2,2,3,3- tetramethyl butane}}{H_3C—C(CH_3)_2–C(CH_3)_2–CH_3} + \underset{\text{sodium bromide}}{2NaBr}$$

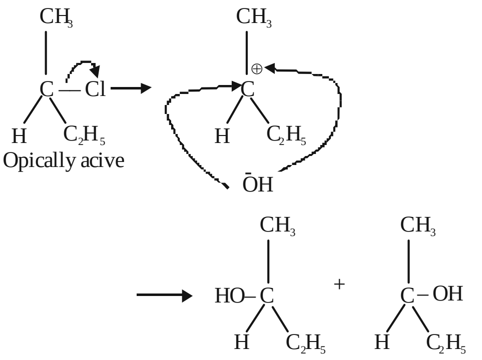
Q.26 (3)

Among the given compounds,



$H_3C—CH_2—\underset{\displaystyle Cl}{\underset{|}{C}H}—CH_3$

will undergo racemisation during alkaline hydrolysis the reaction involved is as follows:



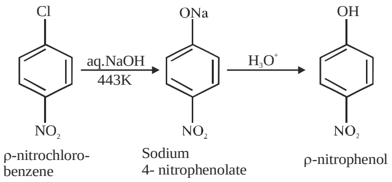
Q.27 (4)

PREVIOUS YEAR'S

MHT

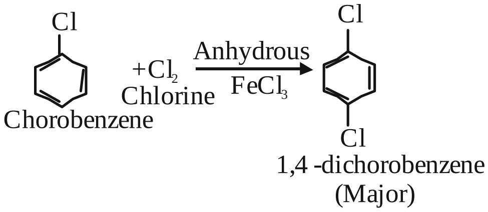
Q.1 (1) **Q.2** (1) **Q.3** (3) **Q.4** (3) **Q.5** (1)
Q.6 (4) **Q.7** (2) **Q.8** (3) **Q.9** (4) **Q.10** (4)
Q.11 (2) **Q.12** (2) **Q.13** (1) **Q.14** (2) **Q.15** (3)
Q.16 (3) **Q.17** (4) **Q.18** (1) **Q.19** (1) **Q.20** (4)
Q.21 (3) **Q.22** (4)

Q.23 (3)



Q.24 (3)

1, 4- dichlorobenzene



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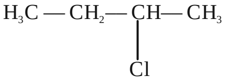
$$\underset{\text{tert – butyl bromide}}{2(CH_3)_3CBR} \xrightarrow{Na/Dry\ ether}$$

$$\underset{\text{2,2,3,3- tetramethyl butane}}{H_3C—C(CH_3)_2– C\ (CH_3)_2– CH_3} + \underset{\text{sodium bromide}}{2NaBr}$$

Q.26 (3)

Among the given compounds,



$H_3C—CH_2—\underset{\displaystyle Cl}{\underset{|}{C}H}—CH_3$

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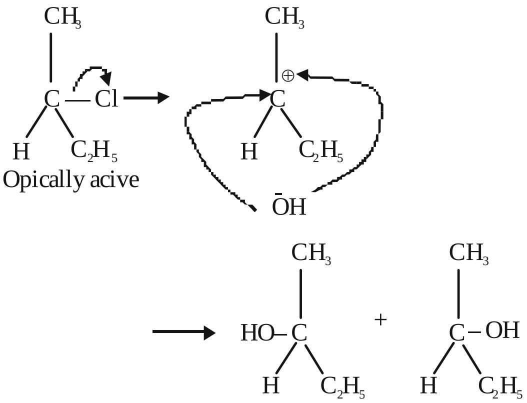
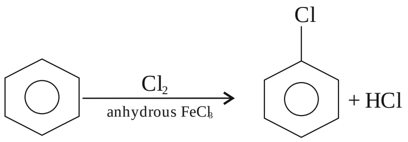


Q.27 (4)

NEET

Q.1 (4)
Q.2 (1)
Q.3 (4)
Q.4 (4)

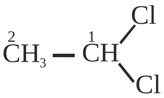


Q.5 (2)

Enantiomers are non-superimposable mirror images of each other.

JEE MAIN

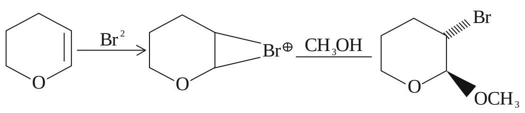
Q. 1 (4)



$\overset{2}{C}H_3 — \overset{1}{C}HCl_2$

Ethylidene chloride
IUPAC Name : 1, 1 - dichloro ethane

Q.2 **(1)**

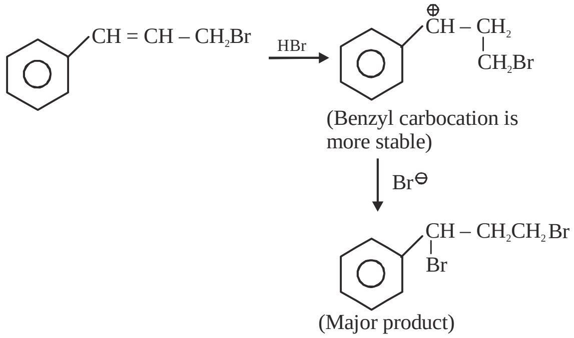


Q.3 [2]

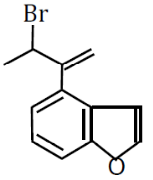
$2\pi e^-$

Q.4 (1)

Q.5 (C)

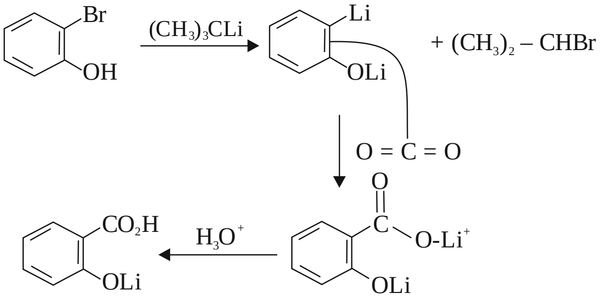


Q. 6 (1)

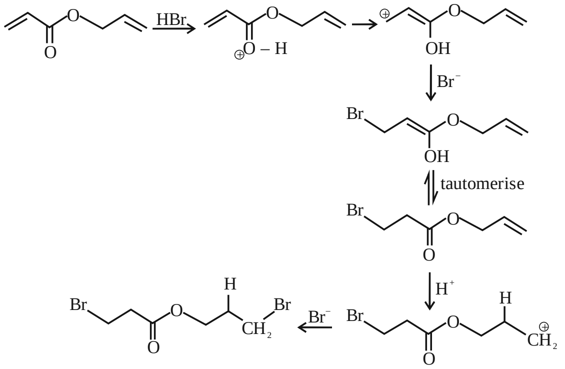


No. of Br atoms = 1

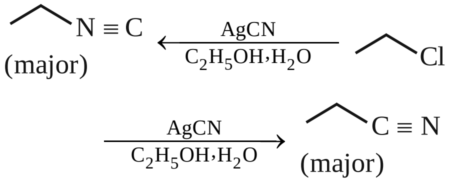
Q.7 **(B)**



Q.8 (4)

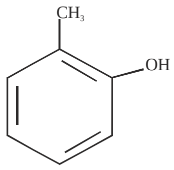


Q.9 (3)



NaCN is ionic in nature, So, in CN⁻ anion 'c' act as nucleophile, and AgCN is covalent in nature, So, 'N' act as nucleophile, as we know CN is ambidentate ligand.

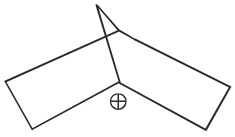
Q. 10 (3)



–OH group is a strong activating group with respect to CH_3 group.

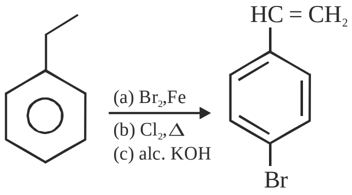
–OH group is a ortho & pera directing group.

Q.11 (3)

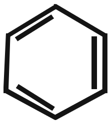


Highly unstable carbocation. Thus carbocation does not form.

Q.12



Q.13 (C)



$$+\ CH_3CH_2CH_2Cl \xrightarrow{\text{Anhydrous, AlCl}_3}$$

$$\text{Mech: } CH_3CH_2CH_2Cl + \text{Anhy AlCl}_3$$

$$\downarrow$$

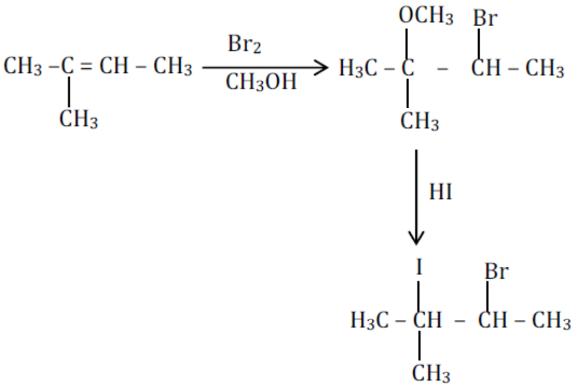
$$CH_3CH_2CH_2^{\oplus} + AlCl_4^{\ominus}$$

$$1^{\circ}C^{\oplus}$$

$$\downarrow$$

$$CH_3-\overset{\oplus}{C}H-CH_2\ 2^{o}C^{\oplus} \text{ more stable}$$

Q.14 (2)



Alcohols, Phenos and Ethers

EXERCISE-I (MHT CET LEVEL)

Q.1 (1)

Q.2 **(3)**

Q.3 (2)

Hydroboration oxidation (Industrial preparation of alcohol)

$$3CH_3CH=CH_2+\frac{1}{2}B_2H_6\xrightarrow[\text{ether}]{\text{Dry}}(CH_3CH_2CH_3)_3B$$

$$(CH_3CH_2CH_3)_3B\xrightarrow{H_2O_2}3CH_3CH_2CH_2-OH$$

Q.4 (3)

$$CH_3-COOH\xrightarrow{LiAlH_4}CH_3CH_2OH$$

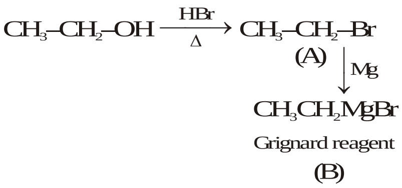
Q.5 (1)

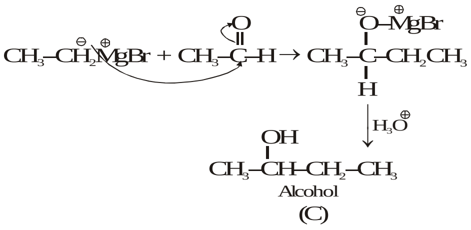
Due to H-bonding glycerol boiling point is more than propanol.

Q.6 **(1)**

Primary Alcohols gives a red colour in victor meyer test.

Q.7 **(3)**





Q.8 (1)

Alkylhalide formation in the reaction of alcohol with HCl undergoes S_N1 reaction in which formation of the carbocation as intermediate occurs. Stability of carbocation is greatest for $(C_6H_5)_3C^+$ due to resonance effect, and stability of tertiary carbocation is greater than the secondary carbocation hence the option (1) shows the correct order.

Q.9 (2)

Q.10 (2)

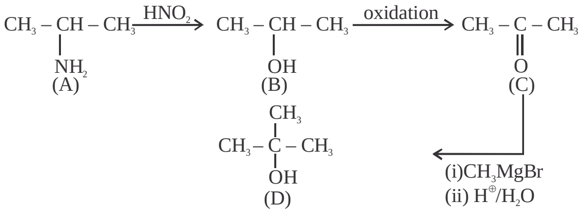
Q.11 (3)

Q.12 (4)

Q.13 **(1)**

Q.14 **(1)**

Q.15 **(3)**



Q.16 **(3)**

Q.17 **(3)**

Q.18 (2)

Alcohol and Acid react with sodium

Alcohol react with sodium to give H_2 gas

Acid react with sodium to give carbonic acid

Ether donot react with sodium

Q.19 (3)

By distilling process we can separate water and ethanol mixture.

Q.20 **(3)**

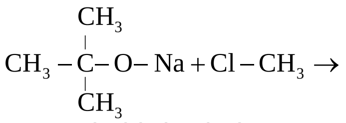
Q.21 **(4)**

Q.22 (2) Williamson's synthesis

$$CH_3-CH_2-ONa+Cl-CH_2-CH_3\rightarrow$$

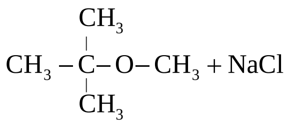
$$CH_3-CH_2-O-CH_2-CH_3$$

Q.23 (2)



$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-O-Na+Cl-CH_3\rightarrow$$

2, 2 dimethyl sodium ethoxide



$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-O-CH_3+NaCl$$

Methyl-t butyl ether

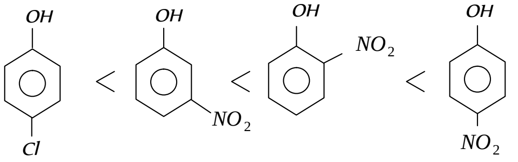
Q.24 (2)

Q.25 **(1,4)**

Q.26 **(2)**

Ether forms an explosive peroxide when kept open in air.

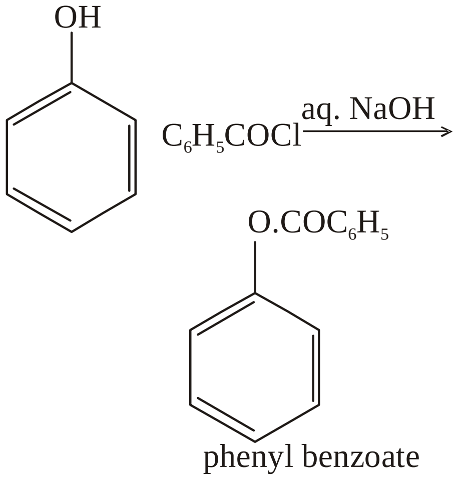
Q.27 (3)
Acidity of phenol ∝ electron withdrawing power of the group



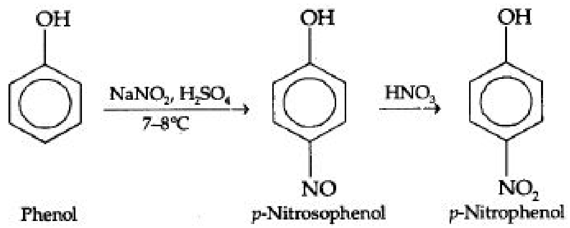
Q.28 (4)

Q.29 **(1)**

Q.30 (1)



Q.31 (2)

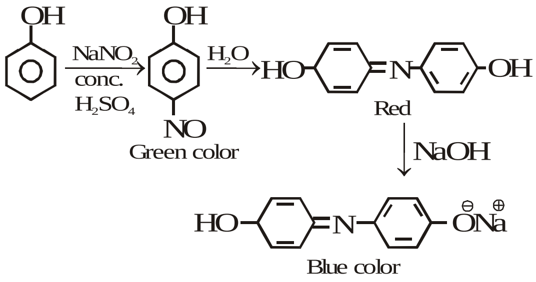


Thus here, oxidation of phenol is minimised by forming p-nitrosophenol.

Q.32 (2)

Q.33 **(4)**

Q.34 (4)

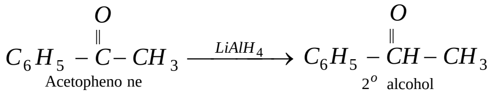


This is known as Liebermann nitroso reaction

Q.35 (1)
Correct order of dehydration in alcohols 3° > 2° > 1°.

EXERCISE-II (NEET LEVEL)

Q.1 (2)



$$\underset{\text{Acetophenone}}{C_6H_5-\overset{\overset{O}{\|}}{C}-CH_3} \xrightarrow{LiAlH_4} \underset{2^o\ \text{alcohol}}{C_6H_5-\overset{\overset{O}{\|}}{CH}-CH_3}$$

Q.2 (4)
$C_2H_5OH > CH \equiv CH > CH_4 > C_2H_6$

Q.3 (1)

$$CO + 2H_2 \xrightarrow[200-300\text{ atm.}]{ZnO/Cr_2O_3} CH_3OH$$

573-673

Q.4 (3)

$$CH_3-CH_2-OH \xrightarrow[170^o C]{\text{Conc. } H_2SO_4} CH_2=CH_2+H_2O$$

Q.5 (1)
Reactivity of Alcohol for esterification

$$\propto \frac{1}{\text{steric hindrance}}$$

1' > 2' > 3'

Q.6 (2)

$$CH_3CH_2OH \xrightarrow[\text{Chromic acid}]{[O]} \underset{(x)}{CH_3CHO} \xrightarrow[\text{Chromic acid}]{[O]} CH_3COOH$$

Q.7 (3)

$$CH_3CHO \xleftarrow[\Delta]{Cu} CH_3CH_2OH \xrightarrow[\Delta]{Al_2O_3} CH_2 = CH_2$$

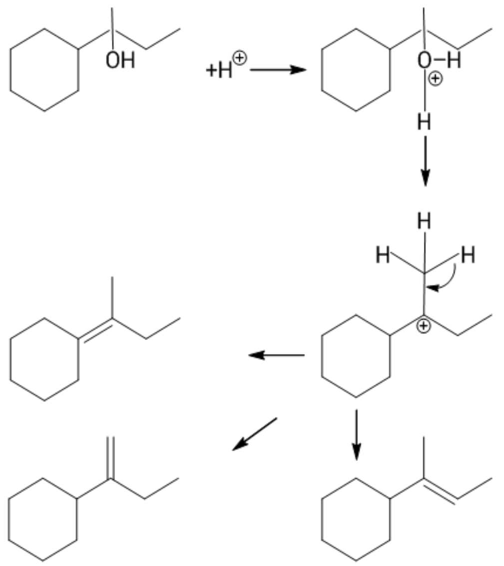
Q.8 (2)

When ethyl alcohol is treated with PCl_5, then ethyl chloride is formed.

$$CH_3CH_2 - OH + PCl_5 \xrightarrow[\Delta]{}$$

$$CH_3CH_2 - Cl + HCl + POCl_3$$

Q.9 (2)



Q.10 (2)

$$(CH_3)_3C\text{-}OH \xrightarrow[-H_2O]{+H^+} (CH_3)_3C^+$$

tertiary alcohol 3^0carbocation (more stable)

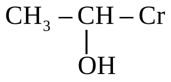
Q.11 (4)

Q.12 (2)

Q.13 (1)

Q.14 **(2)**

Q.15 (2)

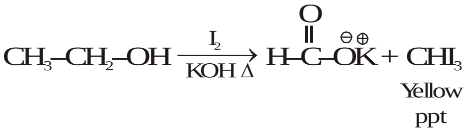


$$CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - Cr$$ This group containing

Alcohols gives positive iodoform test.

Q.16 **(3)**

Ethanol reacts with I_2 and KOH to form Iodoform. Methanol does not respond to this test.



$$CH_3\text{–}CH_2\text{–}OH \xrightarrow[KOH\ \Delta]{I_2} H\text{–}\overset{\displaystyle O}{\overset{\|}{C}}\text{–}\overset{\ominus}{O}\overset{\oplus}{K} + \underset{\text{Yellow ppt}}{CHI_3}$$

Q.17 (2)

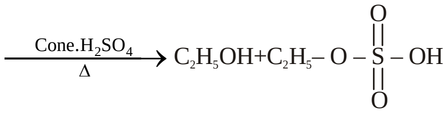
Q.18 (2)

$$CH_3CH_2 - OH + HO - CH_2 - CH_3 \xrightarrow[140^o C]{Conc.\ H_2SO_4}$$

$$\underset{\text{Diethyl ether}}{CH_3CH_2 - O - CH_2 - CH_3} + H_2O$$

Q.19 (3)

$C_2H_5 - O - C_2H_5$



$$\xrightarrow[\Delta]{Cone.H_2SO_4} C_2H_5OH + C_2H_5 - O - \underset{\displaystyle O}{\underset{||}{\overset{\displaystyle O}{\overset{||}{S}}}} - OH$$

Ethyl hydrogen suphate

Q.20 (4)

Williamson synthesis is one of the best methods for the preparation of symmetrial and unsymmetrical ethers. In this method, an alkyl halide is allowed to react with sodium alkoxide

Q.21 **(4)**

Q.22 **(4)**

Q.23 (2)

$$R - O - R + HX \longrightarrow RX + R - OH \xrightarrow{HX} R - X + H_2O$$

Q.24 (1)

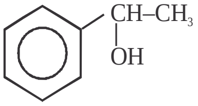
Q.25 (2)

Three, these are

$CH_3CH_2OCH_2CH_3$ (I), $CH_3OCH_2CH_2CH_3$ (II) and $CH_3OCH(CH_3)_2$ (III). Here I and II, I and III are pairs of metamers.

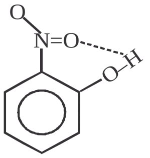
Q.26 (3)

Q.27 **(1)**



This Aliphatic Alcohol But phenol is Aromatic Alcohol

Q.28 **(3)**



O– Nitrophenol has Intra molecular H – Bonding

Q.29 (1)

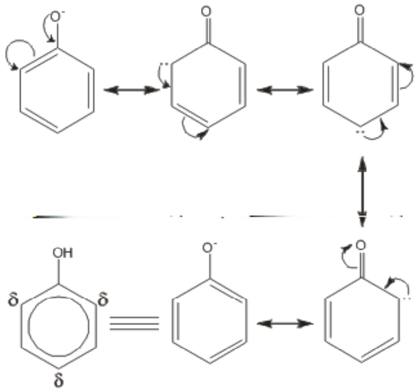
Q.30 (1)

Q.31 (2)
At 120–140°C temperature and 1.5 atm pressure, sodium phenoxide reacts with CO_2 to yield sodium salicylate which on further hydrolysis give to salicylic acid. This reaction is knows as Kolbe's reaction.

Q.32 c)
The acidic nature of phenol is due to the formation of stable phenoxide ion in solution.

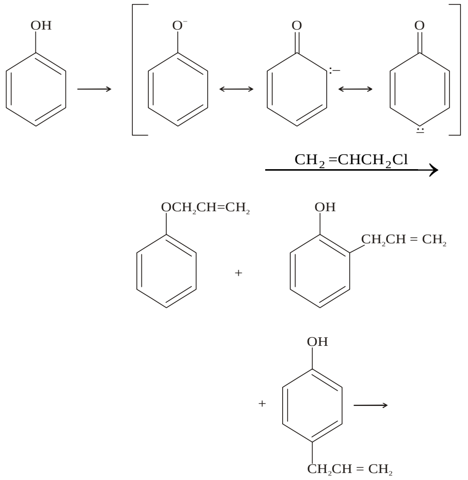
$C_6H_5OH + H_2O \rightleftharpoons C_6H_5O^- + H_3O^+$

The phenoxide ion is stable due to resonance.



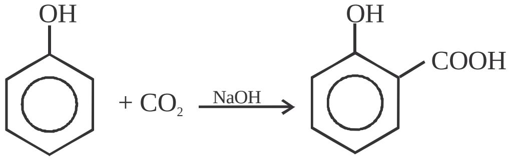
The negative charge is delocalized in the benzene ring which is a stabilizing factor in the phenoxide ion and increase acidity of phenol. whereas no resonance is possible in alkoxide ions (RO^-) derived from alcohol. The negative charge is localized on oxygen atom. Thus, alcohols are not acidic.

Q.33 (3)



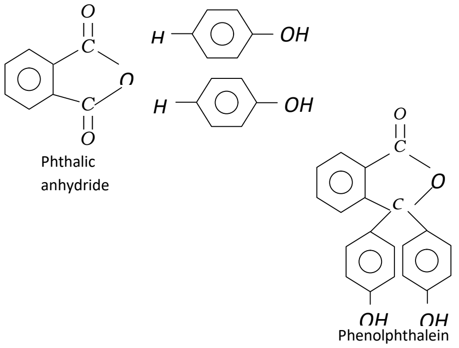
Q.34 (1)

Q.35 (1)



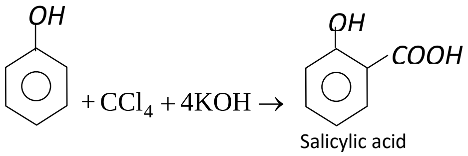
Kolbe's schmidt reaction

Q.36 (4)



Q.37 (2)

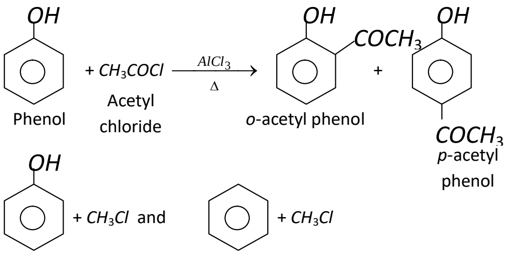
Q.38 (2)



$+ 4KCl + 2H_2O$

Q.39 (2)

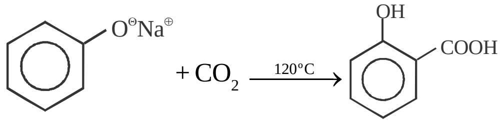
In friedal craft acylation, aromatic compounds such as benzene, phenol etc. undergo acylation with CH_3COCl in the presence of anhydrous $AlCl_3$ and gives ortho and para derivatives. Intermediate is $CH_3C^+ = O$ (acylium ion) of this reaction.



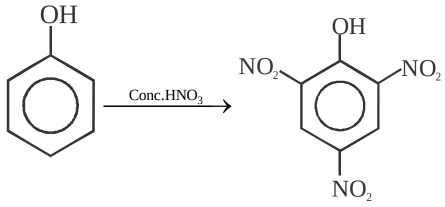
In fact denotes friedel craft alkylation.

Q.40 **(2)**

Kolbe's Schmidt Reaction



Q.41 **(4)**



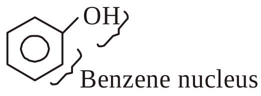
Q.42 (1)

Distillation is most suitable method for separation of 1 : 1 mixture of ortho and para nitrophenol (1 : 1 mix)

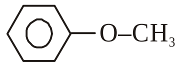
Q.43 (2)

Phenol is more acidic than ethyl alcohol

Q.26 **(2)**



Q.27 **(3)**



Methoxybenzene
(Anisol)

Q.28 **(3)**

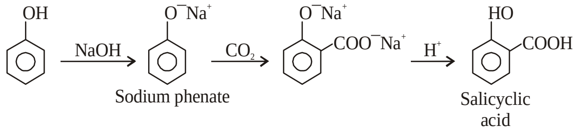
Electron in π bonds are π electrons & lone pair electrons which delocalises in the process of resonance are also counted as π electrons.

Q.29 (4)

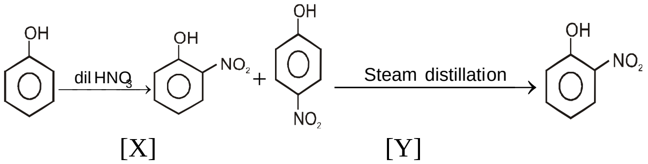
Q.30 (4)

Q.31 (1)

Q.32 **(3)**



Q.33 **(4)**



[Low B.P.due to intramolecular H–Bonding]

Q.34 **(1)**

Q.35 **(1)**

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

Q.36 (3)

Chlorobenzene has π bond in aromatic ring.

Q.37 (2)

Salicylic acid on treatment with bromine water give 2,4,6-tribromophenol.

Q.38 (1)

Salicydehyde is *o*-hydroxybenzaldehyde. It is volatile as it has intramolecular hydrogen bonding.

Q.39 (4)

Due to intramolecular hydrogen bond (chelation) boiling point of o-nitrophenol is less than p-nitrophenol. So they can be separated by distillation.

Q.40 (4)

EXERCISE-IV

Q.1 (4)

(ii) ,(iv),(v),(vi) are only enols

Q.2 4 (III , IV , V , VI)

Q.3 88 gm.

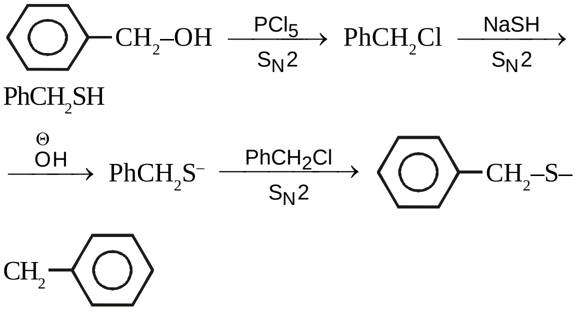
$ROH + CH_3MgX \to CH_4 + ROMgX$

Let molecular mass of alochol is M

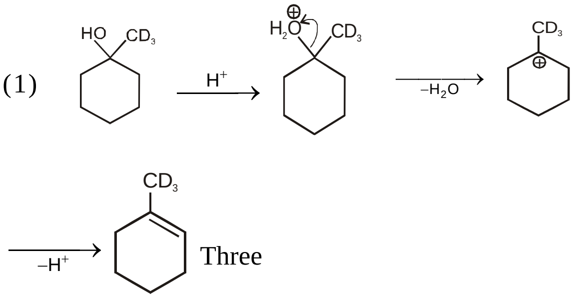
$$\frac{56}{22400} = \frac{0.22}{M}$$

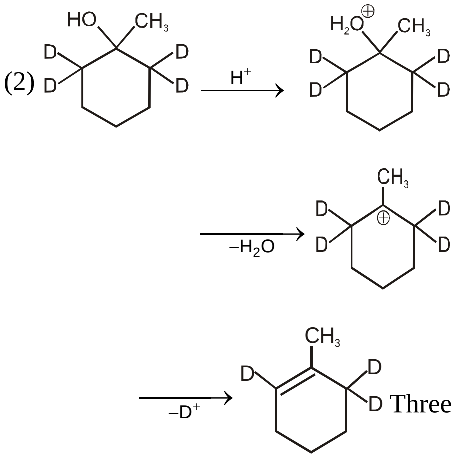
$$M = \frac{22400 \times 0.22}{56} = 88 \text{ gm}$$

Q.4 3.

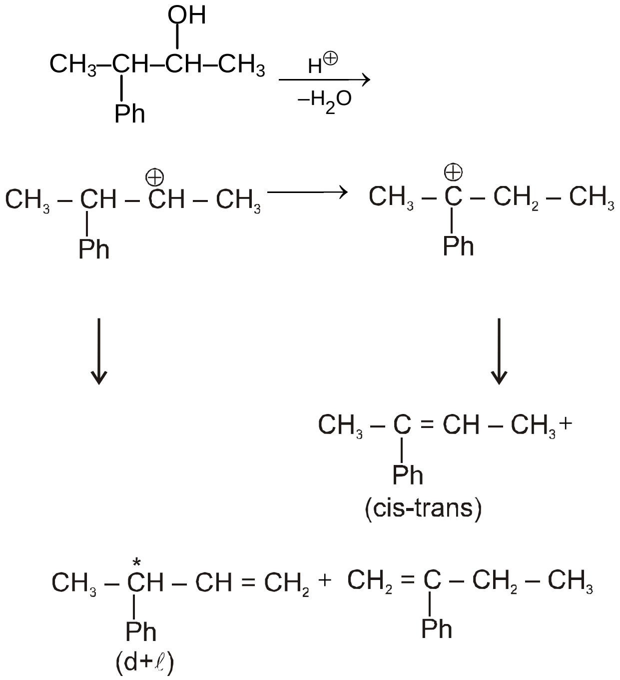


Q.5 6

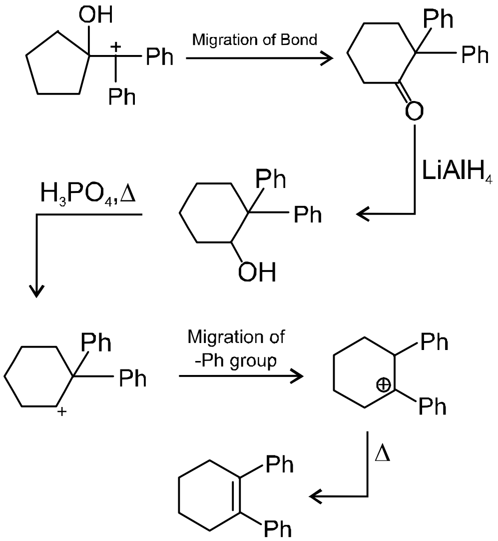




Q.6 5



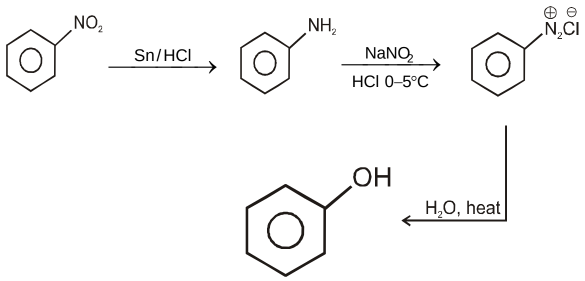
Q.7 78



molecular mass [W] = 234

N = 234/3 = 78

Q.8 94

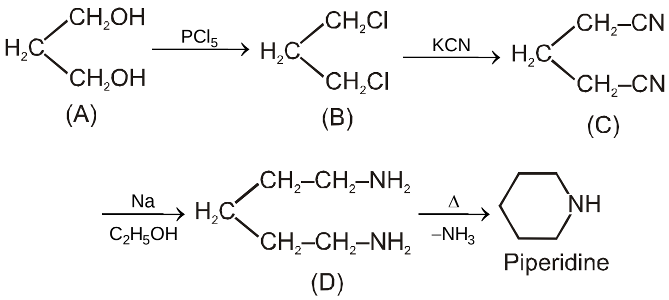


molecular weight of Z = 94

Q.9 $5 + 3 = 8$

(A) $\Rightarrow$ Colour with cerric ammonium nitrate

$\Rightarrow$ Alcoholic group.



PREVIOUS YEAR'S

MHT

Q.1 (3)

Q.2 (1)

Q.3 (3)

Q.4 (2)

Q.5 (2)

Q.6 (2)

Q.7 (1)

Q.8 (4)

Q.9 (4)

Q.10 (1)

Q.11 (1)

Q.12 (3)

Q.13 (4)

Q.14 (3)

Q.15 (4)

Q.16 (4)

Q.17 (2)

Q.18 (4)

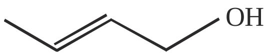
Q.19 (3)

Q.20 (2)

Q.21 (3)

Q.22 (3)

The bond the line structure of crotonyl alcohol is



Q.23 (3)

ρ-nitrophenol has highest melting ponit due to the presence of intermolecular hydrogen bonding which is is not present in all other given compounds

Q.24 (3)

Q.25 (2)

Q.26 (3)

Q.27 (3)

Q.28 (3)

Q.29 (3)

Q.30 (4)

Q.31 (4)

Q.32 (1)

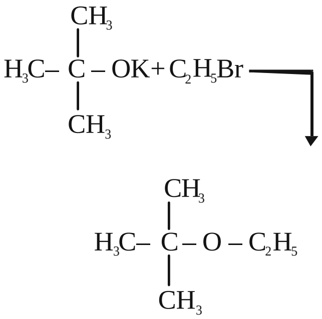
Q.33 (3)

The correct order of hydrogen halides is HI > HBr > HCl . The cleavage of ethers usually takes palce with conc. HI or HBr at high temperature Geater the nucleophlicity of halide ion more the is the reactivity of hydrogen halide

$R—OR + H\,X \rightarrow RX + ROH$

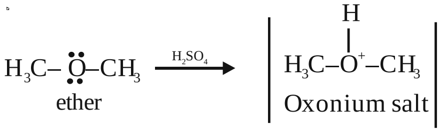
Q.34 (4)

The most effective pair of reagents for the pareparation of tert - butyl enther is potassium tert - butoxide and ethyl bromide.

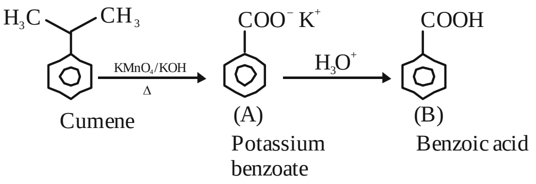


Q.35 (1)

Ethers react with cold concentrated sulphuric acid to form oxonium salts. in ethers due to the presence of lone pairs of electrons on oxygen atoms , it behaves as a lewis base and reacts with a strong acid to form protonated oxonium salt.



Q.36 (1)
Q.37 (1)
Q.38 (4)
Q.39 (2)
Q.40 (2)
Q.41 (3)
Q.42 (2)
Q.43 (2)
Q.44 (2)
Q.45 (2)
Q.46 (4)



Q.47 (4)

PREVIOUS YEAR'S

NEET

Q.12 (4)

$$\underset{\textbf{(A)}}{C_2H_5OH} \xrightarrow{Na} \underset{\textbf{(B)}}{C_2H_5\overset{\ominus}{O}\overset{\oplus}{Na}}$$

$$\downarrow PCl_5$$

$$\underset{\textbf{(C)}}{C_2H_5Cl}$$

$$\underset{\textbf{(B)}}{C_2H_5\overset{\ominus}{O}\overset{\oplus}{Na}} + C_2H_6Cl \xrightarrow{S_N2} C_2H_6OC_2H_6$$

Q.13 (4)

It is Reimer-Tiemann reaction. The electrophile formed is :CCl_2 (Dichlorocarbene) according to the following reaction

$$CHCl_3 + OH^- \rightleftharpoons \overset{\ominus}{\ddot{C}}Cl_3$$

$$\overset{\ominus}{\ddot{C}}Cl_3 \longrightarrow \underset{\text{Electrophile}}{:CCl_2} + Cl^-$$

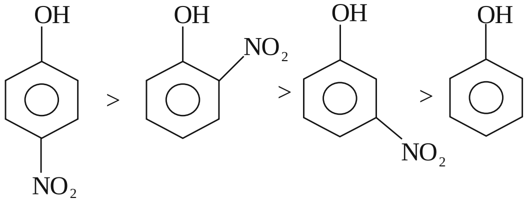
Q.14 (4)

Q.15 (3)

Q.16 (2)

Acidic strength of phenolic group increases due to electron withdrawing groups.

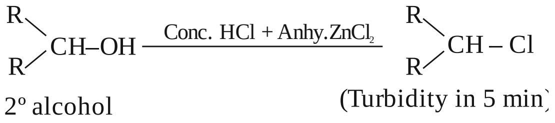
Order of acidic strength



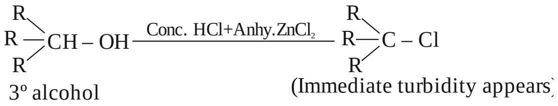
Q.17 (2)

1º, 2º,3º, Alcohol are distinguished by Lucas test on the basis of the time taken for turbidity to apperar

$$\underset{1^{\circ}\ \text{alcohol}}{R-CH_2-OH} \xrightarrow{\text{Conc.HCl+Anhy.}ZnCl_2} \underset{\text{(Turbidity in 5 min.)}}{R-CH_2-Cl}$$



$$\underset{2^{\circ}\ \text{alcohol}}{R_2CH-OH} \xrightarrow{\text{Conc. HCl + Anhy.}ZnCl_2} \underset{\text{(Turbidity in 5 min)}}{R_2CH-Cl}$$



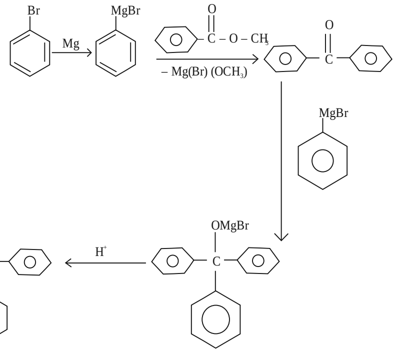
$$\underset{3^{\circ}\ \text{alcohol}}{R_3C-OH} \xrightarrow{\text{Conc. HCl+Anhy.}ZnCl_2} \underset{\text{(Immediate turbidity appears)}}{R_3C-Cl}$$

Reactivity of alcohol towards Lucas reagent

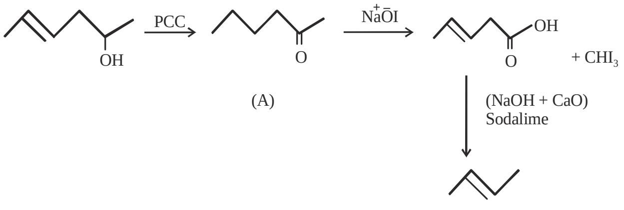
$\Rightarrow 3^{\circ} > 2^{\circ} > 1^{\circ}$ Alcohol

JEE MAIN

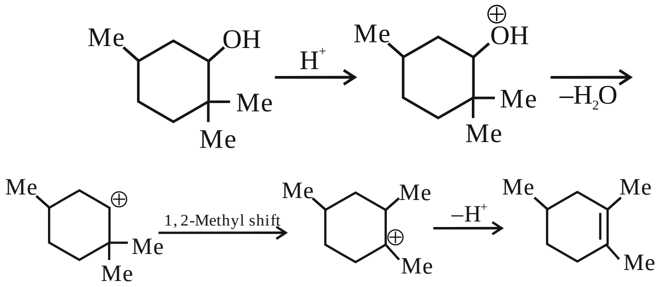
Q.1 (2)



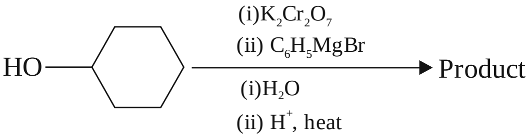
Q.2 (3)

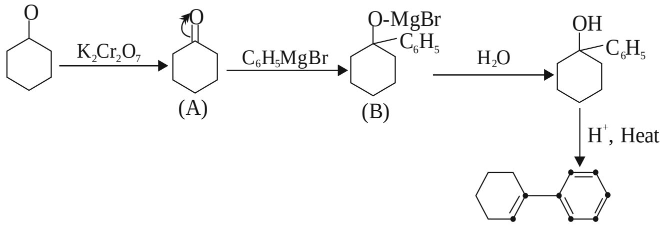


Q. 3 (3)



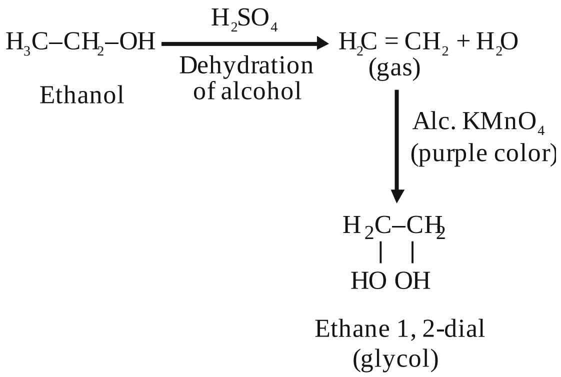
Q.4 (8)





8sp^2 hybrid C-atoms

Q.5 (3)

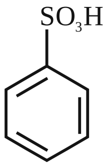


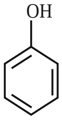
$$H_3C–CH_2–OH \xrightarrow[\text{Dehydration of alcohol}]{H_2SO_4} \underset{\text{(gas)}}{H_2C = CH_2} + H_2O \xrightarrow[\text{(purple color)}]{\text{Alc. } KMnO_4} \underset{HO\quad OH}{H_2C–CH_2}$$

Q.6 [30]

Let initial mole be n,

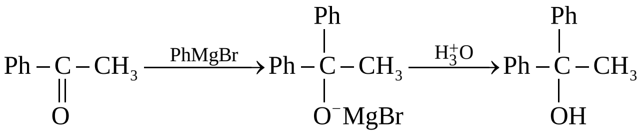
%yield for reaction I is 60%

Mole of  form $\frac{n \times 60}{100} = 0.6\ n$

Mole of  form $\frac{0.6n \times 50}{100} = 0.3\,n$

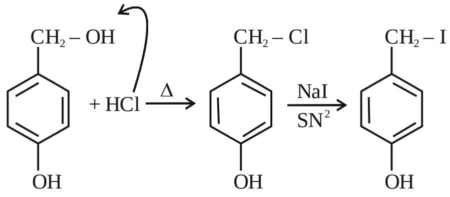
Overall yield of complete reaction = $\frac{0.3n}{n} \times 100 = 30\%$

Q.7 (4)

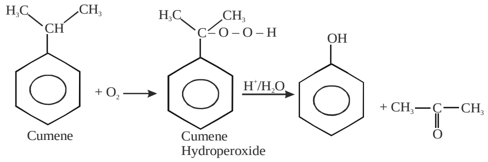


$$Ph-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{PhMgBr} Ph-\overset{Ph}{\underset{O^{-}MgBr}{C}}-CH_3 \xrightarrow{H_3^+O} Ph-\overset{Ph}{\underset{OH}{C}}-CH_3$$

Q.8 (1)

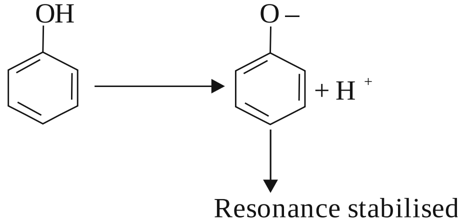


Q. 9 (3)

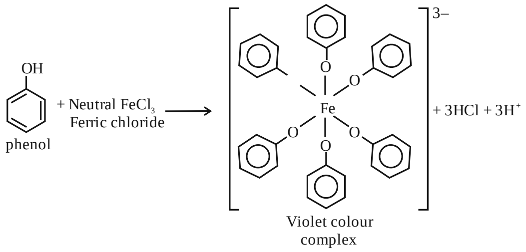


Q.10 (7)

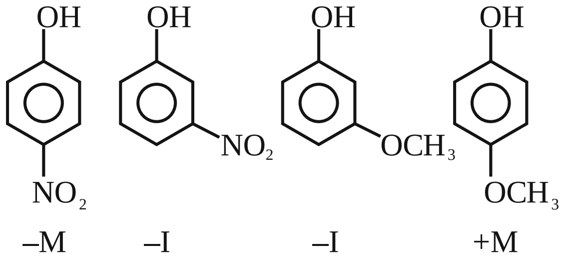
Q.11 (3)



Q.12 (2)



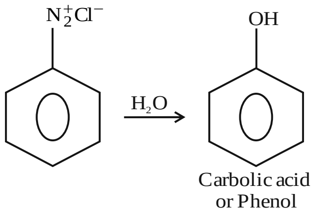
Q.13 (1)



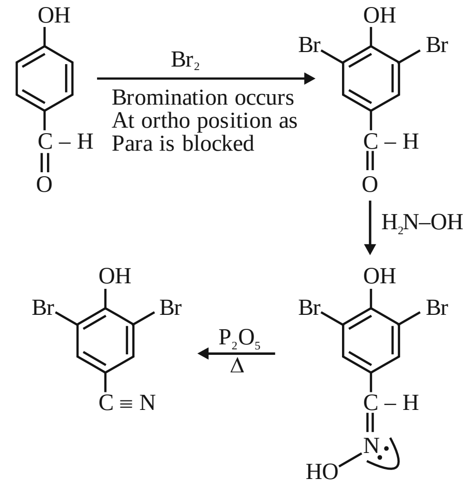
A > B > C > D

Q.14 (2)
The difference in the reaction due to polarity of solvent

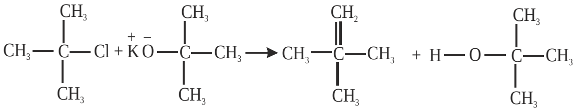
Q.15 (2)



Q.16 (4)

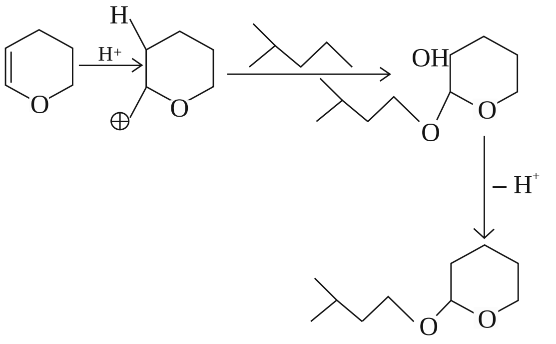


Q. 17 (4)

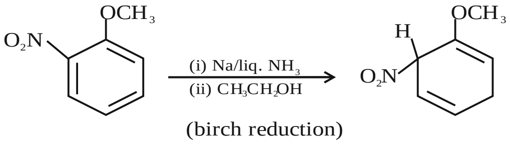


$CH_3-\overset{CH_3}{\underset{CH_3}{C}}-Cl + \overset{+}{K}\overset{-}{O}-\overset{CH_3}{\underset{CH_3}{C}}-CH_3 \longrightarrow CH_3-\overset{CH_2}{\underset{CH_3}{\overset{\|}{C}}}-CH_3 + H-O-\overset{CH_3}{\underset{CH_3}{C}}-CH_3$

Q.18 (4)



Q.19 (1)



Aldehyde, Ketones and Carboxylic Acids

EXERCISE-I (MHT CET LEVEL)

Q.1 (4)
In claisen condensation intermolecular condensation of esters containing α-hydrogen atom in presence of strong base produce β-keto ester.

$CH_3COOC_2H_5 + H.CH2CO.OC2H_5$
Ethyl acetate

$$\overset{C_2H_5Na_2}{\rightleftharpoons} CH_3\overset{O}{\overset{\|}{C}}.\ CH_2COOC_2H_5 + C_2H_5OH$$

Ethyl acetoacetate
(β-ketoester)

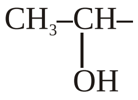
Q.2 (2)

Q.3 (3)

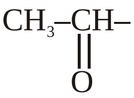
Q.4 **(2)**

Q.5 **(2)**

Q.6 (3)
Formaldehyde can not produce iodoform, as only those compound which contains either



either $CH_3-\underset{OH}{\underset{|}{CH}}-$ group or



$CH_3-\underset{O}{\underset{\|}{CH}}-$ group on reaction with

Potassium iodide and sod. Hypochlorite yield iodoform.

Q.7 (4)

Q.8 (1)

Q.9 **(2)**

Q.10 **(2)**

Q.11 **(3)**

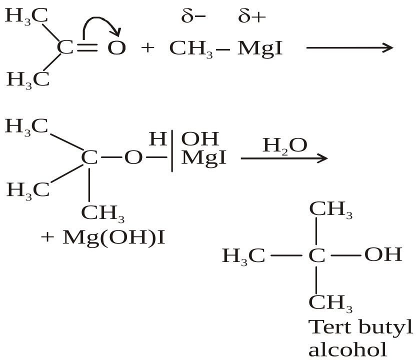
Q.12 **(1)**

Q.13 (2)

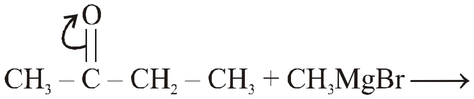
Q.14 (3)

Q.15 (3)

Q.16 (4)



Q.17 **(2)**

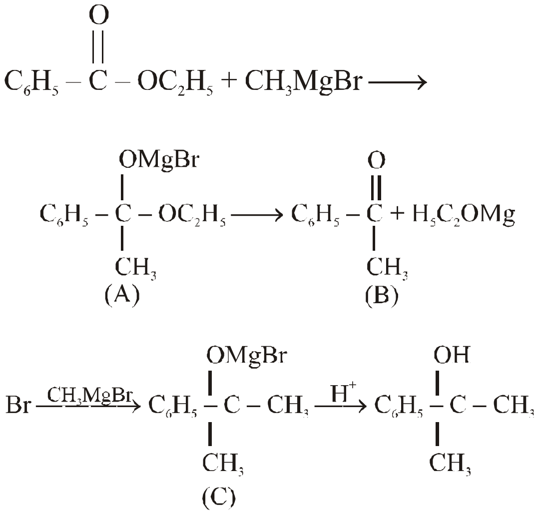


$$CH_3-\overset{O}{\overset{\|}{C}}-CH_2-CH_3+CH_3MgBr\longrightarrow$$

$CH_3-C-CH_2CH_3 \xrightarrow{H_3O^-} CH_3-C-CH_2-CH_3$

$\xrightarrow[-H_2O]{H_2SO_4/170°C} H_3-C=CH-CH_3$

Q.18 **(2)**



Q.19 **(3)**

Q.20 **(1)**

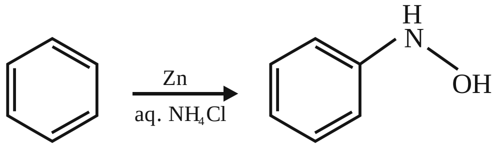
Q.21 **(3)**

Q.22 **(4)**

Q.23 (4)
Proline contains imino (secondary amino) group.

Q.24 (2)
Like clemmensen reduction, Wolf-Kishner reduction involves reduction of > C = O to > CH_2, of course by different reagent,

Q.25 (3)
Reducing reagent is needed, as shown in given reaction.



Q.26 (2)

Q.27 **(4)**

Q.28 **(2)**

Q.29 **(3)**

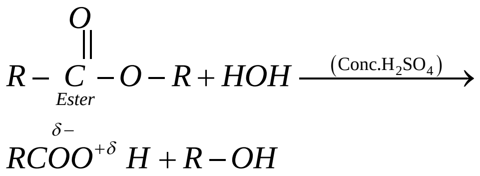
Q.30 **(2)**

Q.31 (3)

Q.32 (2)

Q.33 (1)

When esters are hydrolysed, the acid and alcohol are formed where acid given hydrogen ion.



$$R-\underset{Ester}{\overset{\overset{O}{\|}}{C}}-O-R+HOH\xrightarrow{(Conc.H_2SO_4)}$$

$$\overset{\delta-}{RCOO}^{+\delta}H+R-OH$$

Q.34 (2)
Claisen condensation is given by esters having two α-hydrogen atoms.

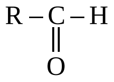
Q.35 **(4)**

EXERCISE-II (NEET LEVEL)

Q.1 (3)

Q.2 (1)
Aldehydes and ketones have same general formula $C_nH_{2n}O$

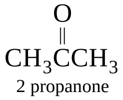
Q.3 (3)



$$R-\underset{\underset{O}{\|}}{C}-H$$

Aldehydes not contain any –OH group

Q.4 (2)



$$\underset{\text{2 propanone}}{CH_3\overset{\overset{O}{\|}}{C}CH_3}$$

Q.5 (3)

$$HC\equiv CH\xrightarrow[20\%H_2SO_4]{1\%HgSO_4}\underset{(A)}{CH_3CHO}\xrightarrow[H_2O]{CH_3MgX}$$

$$\underset{(B)}{CH_3CHOHCH_3}\xrightarrow{[O]}\underset{Acetone}{CH_3COCH_3}$$

Q.6 (2)

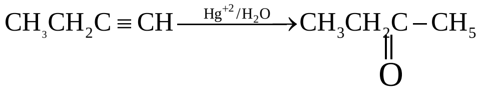
$$(CH_3)_2C=C(CH_3)_2\xrightarrow{O_3}2CH_3-CO-CH_3$$

Q.7 (1)

$$CH_3-COCl+H_2\xrightarrow{pd-BaSO_4}CH_3CHO$$

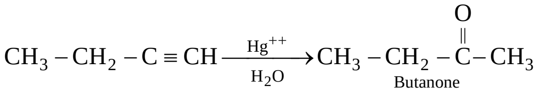
Rosenmund Reduction

Q.8 (1)



$$CH_3CH_2C\equiv CH\xrightarrow{Hg^{+2}/H_2O}CH_3CH_2\underset{\underset{O}{\|}}{C}-CH_5$$

Hydration of Alkynes.
It is hydration of alkynes.



$$CH_3-CH_2-C\equiv CH\xrightarrow[H_2O]{Hg^{++}}\underset{Butanone}{CH_3-CH_2-\overset{\overset{O}{\|}}{C}-CH_3}$$

Q.9 (1)

Q.10 (4)

$$\left.\begin{matrix}CH_3COO\\CH_3COO\end{matrix}\right\rangle Ca+Ca\left\langle\begin{matrix}OOCH\\OOCH\end{matrix}\right.\xrightarrow{Distill}2CH_3CHO+2CaCO_3$$

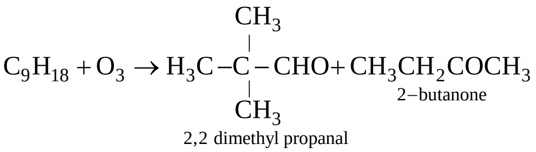
Q.11 (4)

$$CH_4+O_2\xrightarrow{MO_2O_3}HCHO$$

Q.12 (2)

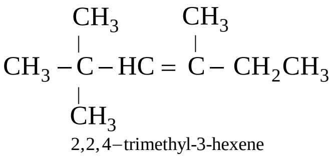
Q.13 (3)

Q.14 (1)



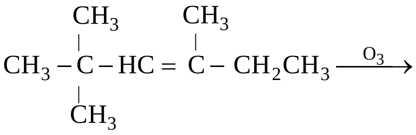
$$C_9H_{18} + O_3 \rightarrow \underset{\text{2,2 dimethyl propanal}}{H_3C-\overset{CH_3}{\underset{CH_3}{C}}-CHO} + \underset{\text{2-butanone}}{CH_3CH_2COCH_3}$$

On the basis of product formation, it would be alkene

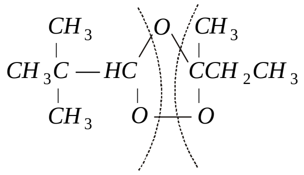


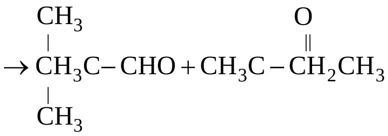
$$CH_3-\overset{CH_3}{\underset{CH_3}{C}}-HC=\overset{CH_3}{C}-CH_2CH_3$$

2,2,4–trimethyl-3-hexene



$$CH_3-\overset{CH_3}{\underset{CH_3}{C}}-HC=\overset{CH_3}{C}-CH_2CH_3 \xrightarrow{O_3}$$

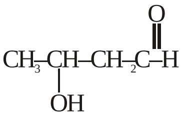




$$\rightarrow CH_3\overset{CH_3}{\underset{CH_3}{C}}-CHO + CH_3\overset{O}{\overset{\|}{C}}-CH_2CH_3$$

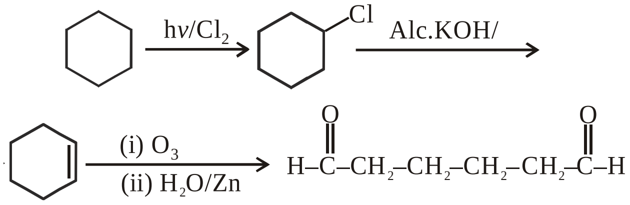
Q.15 (4)

$$HC\equiv CH \xrightarrow[HgSO_4]{30\%H_2SO_4} CH_3CHO \xrightarrow[\text{Aldol reactions}]{NaOH}$$

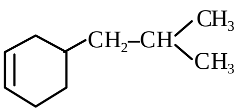


$$CH_3-\underset{OH}{CH}-CH_2-\overset{O}{\overset{\|}{C}}-H$$

Q.16 (4)



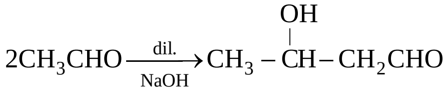
Q.17 (1)



Q.18 (1)

$$\underset{\text{Benzaldehyde}}{C_6H_5CHO} \xrightarrow[H^+/H_2O]{CH_3MgBr} \underset{2^\circ\text{ Alcohol}}{C_6H_5CH(OH)CH_3}$$

Q.19 (3)



$$2CH_3CHO \xrightarrow[NaOH]{dil.} CH_3-\overset{OH}{\overset{|}{CH}}-CH_2CHO$$

Q.20 (3)

$$C_2H_5CHO + 2Cu^{+2} + 5OH^- \rightarrow \underset{\text{Red ppt}}{Cu_2O} + 3H_2O$$

$$+C_2H_5COO^-$$

$$CH_3COCH_3 + 2Cu^{+2} + 5OH^- \rightarrow \text{No reaction}$$

Q.21 (3)
Deuterium behaves like H and hence trideuteroacetaldehyde also undergoes aldol condensation but benzaldehyde does not since it has no α-hydrogen.

Q.22 (1)

Q.23 (2)

1^o Primary alcohol $\xrightarrow{ZnCl_2/HCl}$
White turbidity only heating

2^o Alcohol $\xrightarrow{ZnCl_2/HCl}$ White turbidity
after 5 min heating

3^o Alcohol $\xrightarrow{ZnCl_2/HCl}$ easily in seconds

Q.24 (2)

$$CH_3CHO + 2H \xrightarrow{Na/C_2H_5OH} CH_3CH_2OH$$

Q.25 (2)

$$C_6H_5CHO + (CH_3CO)_2O \xrightarrow{CH_3CO_2Na}$$

$$C_6H_5CH = CHCO_2H$$

It is Perkin's reaction.

Q.26 (3)
Propanone not gives fehling's test and Tollent's test. Benzaldehyde gives Tollen's Test But not Fehling's Test Acetaldehyde gives Test with Tollen's reagent and Fehling's Reagent both.

Q.27 (4)

$$2C_6H_5CHO \xrightarrow{50\%\,NaOH} C_6H_5COONa +$$

$$C_6H_5CH_2OH$$

It is Cannizzaro's reaction

Q.28 (1)

Because acetone require stronger oxidising agent and hence not oxidized with Fehling solution to give brick red *ppt*.

Q.29 (2)

$$CH_3CHO \xrightarrow{HCN} CH_3CH(OH)CN \xrightarrow{H_2O/H^+} CH_3CH(OH)COOH$$

Q.30 (2)

Fehling solution is a weak oxidising agent therefore unable to oxidise benzaldehyde.

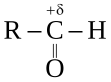
Q.31 (2)

Formic acid is only carboxylic acid which can give fehling solution Test.

Q.32 (3)

Only aliphatic aldehyde reduce fehling solution. Hence, acetaldehyde give red ppt. with fehling solution.

Q.33 (2)



$R-\overset{+\delta}{\underset{\underset{O}{\|}}{C}}-H$; Susceptibility of nucleophilic attack on aldehyde is decreased by electron releasing effect of *R* group. Decreasing order of aldehyde towards nucleophilic attack is 1° > 2° > 3° *R* group.

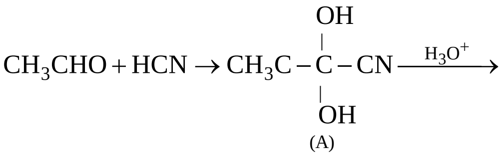
Q.34 (1)

Wolf kischner reduction : Hydrazine (NH_2-NH_2) followed by reaction with strong base like *KOH* reduce carbonyl group into alkyl group.

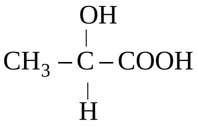
Q.35 (3)

$(CH_2)_6N_4$ is urotropine, which is used as urinary antiseptic.

Q.36 (4)

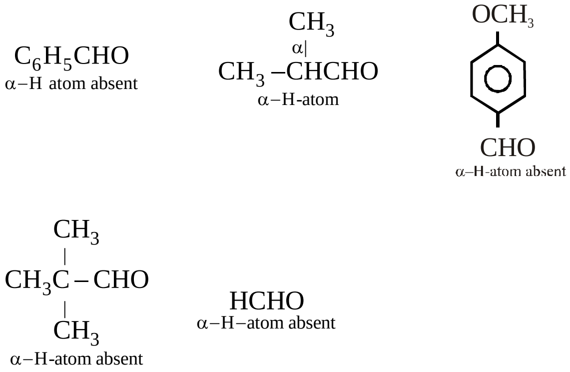


$$CH_3CHO + HCN \rightarrow \underset{(A)}{CH_3C-\overset{\overset{OH}{|}}{\underset{\underset{OH}{|}}{C}}-CN} \xrightarrow{H_3O^+}$$



$$CH_3-\overset{\overset{OH}{|}}{\underset{\underset{H}{|}}{C}}-COOH$$

Q.37 (2)



$\underset{\alpha-\text{H atom absent}}{C_6H_5CHO}$

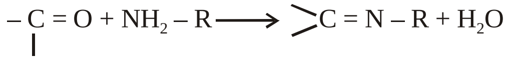
$\underset{\alpha-\text{H-atom}}{CH_3-\overset{\overset{CH_3}{\alpha|}}{C}HCHO}$

α–H-atom absent

$\underset{\alpha-\text{H-atom absent}}{CH_3\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CHO}$

$\underset{\alpha-\text{H}-\text{atom absent}}{HCHO}$

Q.38 (3)



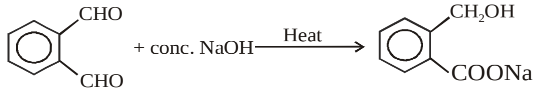
$$-\underset{|}{C}=O + NH_2-R \longrightarrow \ \rangle C=N-R+H_2O$$

This is addition and elimination reaction

Q.39 (2)

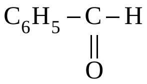
Hyride transfer is slowest step.

Q.40 (3)

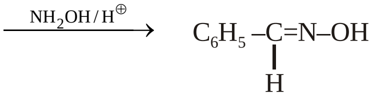


Cannizaro reaction

Q.41 (3)



$$C_6H_5-\underset{\underset{O}{\|}}{C}-H$$



$$\xrightarrow{NH_2OH/H^{\oplus}} C_6H_5-\underset{\underset{H}{|}}{C}=N-OH$$

mixture of syn & anti oxime

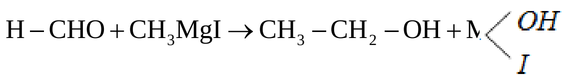
Q.42 (1)

Base-catalysed aldol condensation occurs with Propionaldehyde

Q.43 (3)

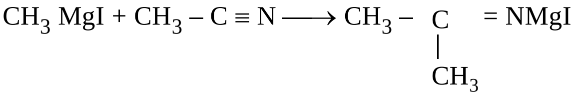
$$\underset{\text{Acetone}}{CH_3COCH_3} \xrightarrow{CH_3MgI} \underset{\text{tert-Butyl alcohol}}{(CH_3)_3COH}$$

Q.44 (3)

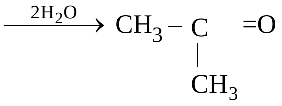


$$H-CHO+CH_3MgI \rightarrow CH_3-CH_2-OH+Mg\begin{cases}OH\\I\end{cases}$$

Q.45 (2)

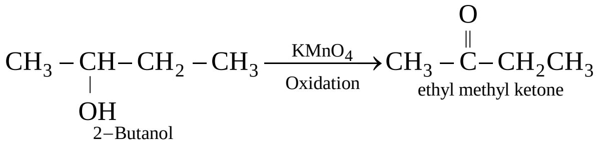


$$CH_3\,MgI + CH_3-C\equiv N \longrightarrow CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=NMgI$$



$$\xrightarrow{2H_2O} CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}=O$$

Q.46 (3)



$$\underset{\text{2−Butanol}}{CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-CH_3} \xrightarrow[\text{Oxidation}]{KMnO_4} \underset{\text{ethyl methyl ketone}}{CH_3-\overset{\displaystyle O}{\overset{||}{C}}-CH_2CH_3}$$

Q.47 (2)

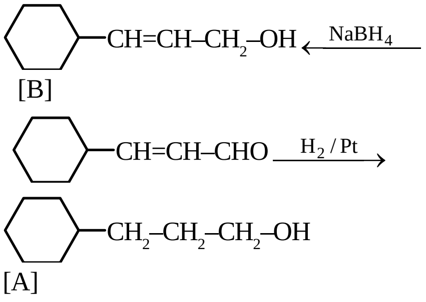
Q.48 (4)
All test for Aldehyde because ketone require strong oxidising agent.

$$2[Ag(NH_3)_2]^+ + RCHO \rightarrow RCOOH + 2Ag + 4NH_3 + H_2O$$

Q.49 (3)

$$\underset{\text{Propanal}}{CH_3-CH_2-CHO} \xrightarrow{\text{Oxidation}} \underset{\text{Propanoic acid}}{CH_3CH_2-COOH}$$

Q.50 (4)



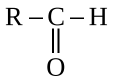
Therefore option (2) is correct.

EXERCISE-II (NEET LEVEL)

Q.1 (3)

Q.2 (1)
Aldehydes and ketones have same general formula $C_nH_{2n}O$

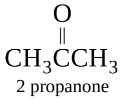
Q.3 (3)



$$R-\underset{\displaystyle O}{\underset{||}{C}}-H$$

Aldehydes not contain any –OH group

Q.4 (2)



$$\underset{\text{2 propanone}}{CH_3\overset{\displaystyle O}{\overset{||}{C}}CH_3}$$

Q.5 (3)

$$HC\equiv CH \xrightarrow[20\%\,H_2SO_4]{1\%\,HgSO_4} \underset{(A)}{CH_3CHO} \xrightarrow[H_2O]{CH_3MgX}$$

$$\underset{(B)}{CH_3CHOHCH_3} \xrightarrow{[O]} \underset{\text{Acetone}}{CH_3COCH_3}$$

Q.6 (2)

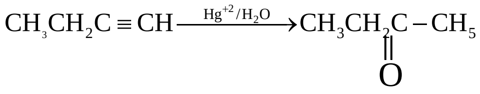
$$(CH_3)_2C=C(CH_3)_2 \xrightarrow{O_3} 2CH_3-CO-CH_3$$

Q.7 (1)

$$CH_3-COCl+H_2 \xrightarrow{pd-BaSO_4} CH_3CHO$$

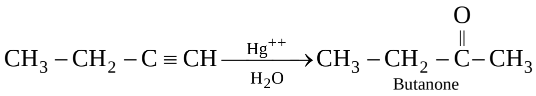
Rosenmund Reduction

Q.8 (1)



$$CH_3CH_2C\equiv CH \xrightarrow{Hg^{+2}/H_2O} CH_3CH_2\underset{\displaystyle O}{\underset{||}{C}}-CH_5$$

Hydration of Alkynes.
It is hydration of alkynes.



$$CH_3-CH_2-C\equiv CH \xrightarrow[H_2O]{Hg^{++}} \underset{\text{Butanone}}{CH_3-CH_2-\overset{\displaystyle O}{\overset{||}{C}}-CH_3}$$

Q.9 (1)

Q.10 (4)

$$\left.\begin{matrix}CH_3COO\\CH_3COO\end{matrix}\right\rangle Ca + Ca\left\langle\begin{matrix}OOCH\\OOCH\end{matrix}\right. \xrightarrow{\text{Distill}}$$

$$2CH_3CHO+2CaCO_3$$

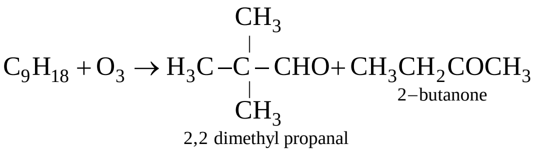
Q.11 (4)

$$CH_4 + O_2 \xrightarrow{MO_2O_3} HCHO$$

Q.12 (2)

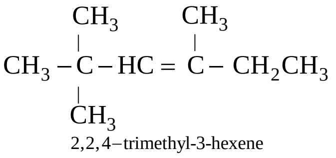
Q.13 (3)

Q.14 (1)

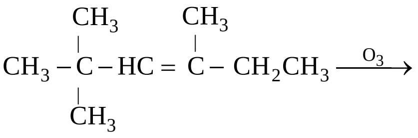


$$C_9H_{18} + O_3 \rightarrow \underset{\text{2,2 dimethyl propanal}}{H_3C-\overset{CH_3}{\underset{CH_3}{C}}-CHO} + \underset{\text{2−butanone}}{CH_3CH_2COCH_3}$$

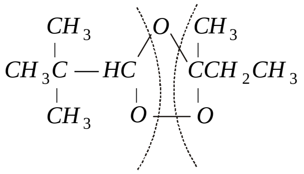
On the basis of product formation, it would be alkene

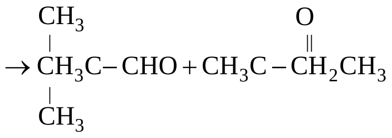


$$\underset{\text{2,2,4−trimethyl-3-hexene}}{CH_3-\overset{CH_3}{\underset{CH_3}{C}}-HC=\overset{CH_3}{C}-CH_2CH_3}$$



$$CH_3-\overset{CH_3}{\underset{CH_3}{C}}-HC=\overset{CH_3}{C}-CH_2CH_3 \xrightarrow{O_3}$$

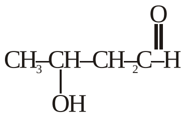




$$\rightarrow CH_3\overset{CH_3}{\underset{CH_3}{C}}-CHO + CH_3\overset{O}{\overset{\|}{C}}-CH_2CH_3$$

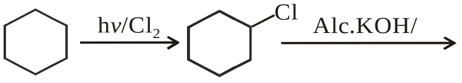
Q.15 (4)

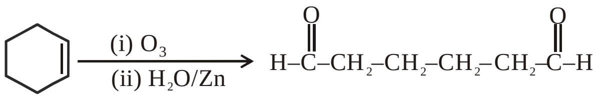
$$HC\equiv CH \xrightarrow[HgSO_4]{30\%H_2SO_4} CH_3CHO \xrightarrow[\text{Aldol reactions}]{NaOH}$$



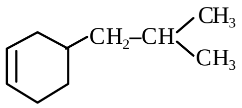
$$CH_3-\underset{OH}{CH}-CH_2-\overset{O}{\overset{\|}{C}}-H$$

Q.16 (4)





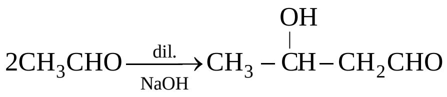
Q.17 (1)



Q.18 (1)

$$\underset{\text{Benzaldehyde}}{C_6H_5CHO} \xrightarrow[H^+/H_2O]{CH_3MgBr} \underset{2^\circ\,\text{Alcohol}}{C_6H_5CH(OH)CH_3}$$

Q.19 (3)



$$2CH_3CHO \xrightarrow[NaOH]{dil.} CH_3-\overset{OH}{\overset{|}{CH}}-CH_2CHO$$

Q.20 (3)

$$C_2H_5CHO + 2Cu^{+2} + 5OH^- \rightarrow \underset{\text{Red ppt}}{Cu_2O} + 3H_2O$$

$$+C_2H_5COO^-$$

$$CH_3COCH_3 + 2Cu^{+2} + 5OH^- \rightarrow \text{No reaction}$$

Q.21 (3)

Deuterium behaves like H and hence trideuteroacetaldehyde also undergoes aldol condensation but benzaldehyde does not since it has no α-hydrogen.

Q.22 (1)

Q.23 (2)

1^o Primary alcohol $\xrightarrow{ZnCl_2/HCl}$

White turbidity only heating

2^o Alcohol $\xrightarrow{ZnCl_2/HCl}$ White turbidity after 5 min heating

3^o Alcohol $\xrightarrow{ZnCl_2/HCl}$ easily in seconds

Q.24 (2)

$$CH_3CHO + 2H \xrightarrow{Na/C_2H_5OH} CH_3CH_2OH$$

Q.25 (2)

$$C_6H_5CHO + (CH_3CO)_2O \xrightarrow{CH_3CO_2Na}$$

$$C_6H_5CH = CHCO_2H$$

It is Perkin's reaction.

Q.26 (3)
Propanone not gives fehling's test and Tollent's test. Benzaldehyde gives Tollen's Test But not Fehling's Test Acetaldehyde gives Test with Tollen's reagent and Fehling's Reagent both.

Q.27 (4)

$$2C_6H_5CHO \xrightarrow{50\%\ NaOH} C_6H_5COONa + C_6H_5CH_2OH$$

It is Cannizzaro's reaction

Q.28 (1)
Because acetone require stronger oxidising agent and hence not oxidized with Fehling solution to give brick red *ppt*.

Q.29 (2)

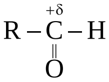
$$CH_3CHO \xrightarrow{HCN} CH_3CH(OH)CN \xrightarrow{2H_2O/H^+} CH_3CH(OH)COOH$$

Q.30 (2)
Fehling solution is a weak oxidising agent therefore unable to oxidise benzaldehyde.

Q.31 (2)
Formic acid is only carboxylic acid which can give fehling solution Test.

Q.32 (3)
Only aliphatic aldehyde reduce fehling solution. Hence, acetaldehyde give red ppt. with fehling solution.

Q.33 (2)

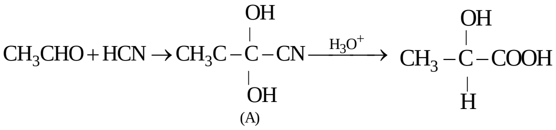


$\underset{\underset{O}{\|}}{\overset{+\delta}{R-C-H}}$; Susceptibility of nucleophilic attack on aldehyde is decreased by electron releasing effect of *R* group. Decreasing order of aldehyde towards nucleophilic attack is 1° > 2° > 3° *R* group.

Q.34 (1)
Wolf kischner reduction : Hydrazine (NH_2-NH_2) followed by reaction with strong base like *KOH* reduce carbonyl group into alkyl group.

Q.35 (3)
$(CH_2)_6N_4$ is urotropine, which is used as urinary antiseptic.

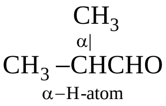
Q.36 (4)



$$CH_3CHO + HCN \rightarrow \underset{(A)}{CH_3C-\overset{OH}{\underset{OH}{C}}-CN} \xrightarrow{H_3O^+} CH_3-\overset{OH}{\underset{H}{C}}-COOH$$

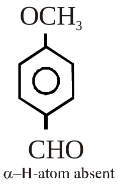
Q.37 (2)

C_6H_5CHO
α–H atom absent

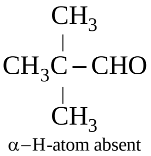


$$\overset{CH_3}{\underset{\alpha|}{}}\ CH_3-CHCHO$$

α–H-atom



α–H-atom absent



$$CH_3\overset{CH_3}{\underset{CH_3}{C}}-CHO$$

α–H-atom absent

HCHO
α–H–atom absent

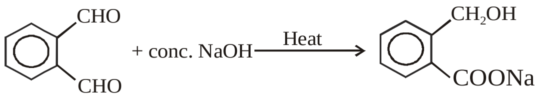
Q.38 (3)

$$-\underset{|}{C}=O + NH_2-R \longrightarrow \rangle C=N-R+H_2O$$

This is addition and elimination reaction

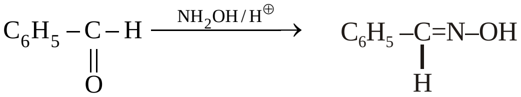
Q.39 (2)
Hyride transfer is slowest step.

Q.40 (3)



Cannizaro reaction

Q.41 (3)



$$C_6H_5-\underset{\underset{O}{\|}}{C}-H \xrightarrow{NH_2OH/H^{\oplus}} C_6H_5-\underset{\underset{H}{|}}{C}=N-OH$$

mixture of syn & anti oxime

Q.42 (1)
Base-catalysed aldol condensation occurs with Propionaldehyde

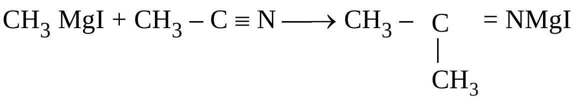
Q.43 (3)

$$\underset{\text{Acetone}}{CH_3COCH_3} \xrightarrow{CH_3MgI} \underset{\text{tert-Butyl alcohol}}{(CH_3)_3COH}$$

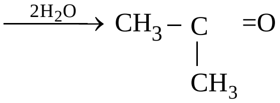
Q.44 (3)

$$H-CHO + CH_3MgI \rightarrow CH_3-CH_2-OH + M\langle\begin{matrix}OH\\ I\end{matrix}$$

Q.45 (2)

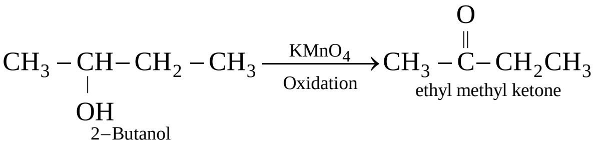


$$CH_3MgI + CH_3-C\equiv N \longrightarrow CH_3-\underset{CH_3}{\underset{|}{C}}=NMgI$$



$$\xrightarrow{2H_2O} CH_3-\underset{CH_3}{\underset{|}{C}}=O$$

Q.46 (3)



$$\underset{\text{2-Butanol}}{CH_3-\underset{OH}{\underset{|}{CH}}-CH_2-CH_3} \xrightarrow[\text{Oxidation}]{KMnO_4} \underset{\text{ethyl methyl ketone}}{CH_3-\overset{O}{\overset{||}{C}}-CH_2CH_3}$$

Q.47 (2)

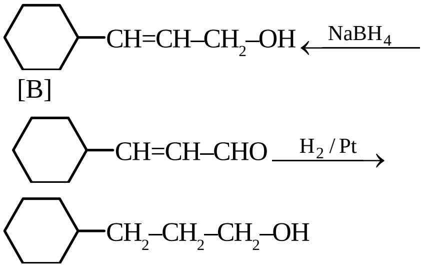
Q.48 (4)
All test for Aldehyde because ketone require strong oxidising agent.

$$2[Ag(NH_3)_2]^+ + RCHO \rightarrow RCOOH + 2Ag + 4NH_3 + H_2O$$

Q.49 (3)

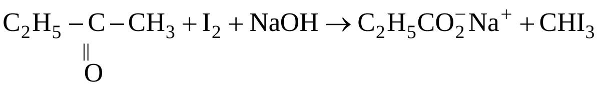
$$\underset{\text{Propanal}}{CH_3-CH_2-CHO} \xrightarrow{\text{Oxidation}} \underset{\text{Propanoic acid}}{CH_3CH_2-COOH}$$

Q.50 (4)



[A]
Therefore option (2) is correct.

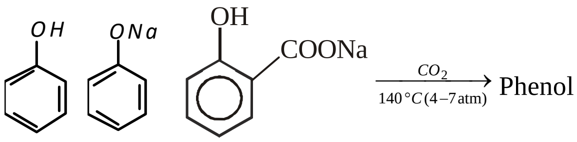
Q.51 (3)



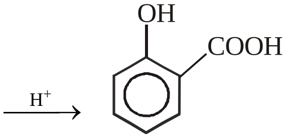
$$C_2H_5-\underset{O}{\underset{||}{C}}-CH_3 + I_2 + NaOH \rightarrow C_2H_5CO_2^-Na^+ + CHI_3$$

$$C_2H_5CO_2^-Na^+ \xrightarrow{H^+} C_2H_5COOH + Na^+$$

Q.52 (4)
Treatment of sodium salt of phenol with CO_2 under pressure bring about substitution of the carbonyl group $-COOH$, for the hydrogen of the ring. This is called as Kolbe's reaction

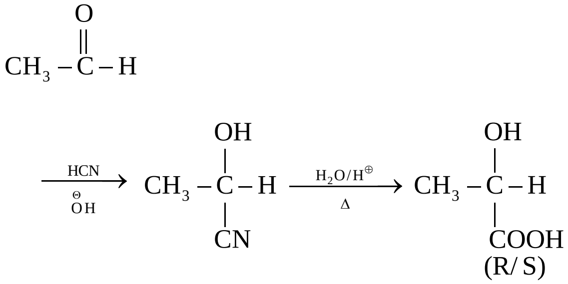


Sodium salt of phenol Sodium salicylate



Salicylic acid

Q.53 (3)

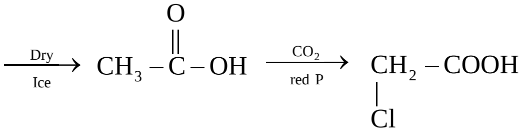


$$CH_3-\overset{O}{\overset{||}{C}}-H \xrightarrow[\overset{\ominus}{O}H]{HCN} CH_3-\underset{CN}{\underset{|}{\overset{OH}{\overset{|}{C}}}}-H \xrightarrow[\Delta]{H_2O/H^{\oplus}} CH_3-\underset{\underset{(R/S)}{COOH}}{\underset{|}{\overset{OH}{\overset{|}{C}}}}-H$$

Q.54 (4)

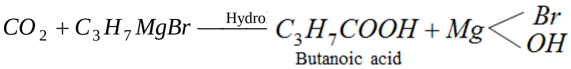
Q.55 (4)

$$CH_3I \xrightarrow[\text{ether}]{Mg} CH_3MgI$$



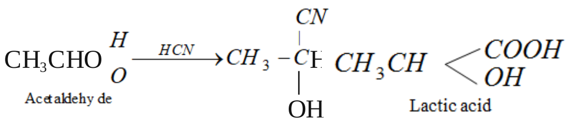
$$\xrightarrow[\text{Ice}]{\text{Dry}} CH_3-\overset{O}{\overset{||}{C}}-OH \xrightarrow[\text{red P}]{CO_2} \underset{Cl}{\underset{|}{CH_2}}-COOH$$

Q.56 (1)



$$CO_2 + C_3H_7MgBr \xrightarrow{\text{Hydro}} \underset{\text{Butanoic acid}}{C_3H_7COOH} + Mg\begin{matrix} Br \\ OH \end{matrix}$$

Q.57 (3)



$$\underset{\text{Acetaldehyde}}{CH_3CHO} \overset{H}{\underset{O}{}} \xrightarrow{HCN} CH_3-\underset{OH}{\underset{|}{\overset{CN}{\overset{|}{CH}}}} \quad \underset{\text{Lactic acid}}{CH_3CH\begin{matrix} COOH \\ OH \end{matrix}}$$

Q.58 (2)
CO_2 adds to Grignard's reagent to yield acids.

$$CO_2 \xrightarrow{CH_3MgI} CH_3COOMgI \xrightarrow{H.OH} +Mg\begin{smallmatrix}OH\\ I\end{smallmatrix}$$

Q.59 (1)

$$C_2H_2 \xrightarrow[HgSO_4\ 1\%]{H_2SO_4\ dil.} CH_3CHI \xrightarrow{[O]} CH_3–COOH$$

$$\xrightarrow{NaOH} CH_3COONa \xrightarrow[CaO]{NaOH} CH_4$$

decarboxylation

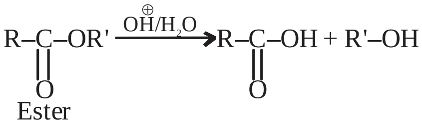
Q.60 (1)

$$C_2H_5OH \xrightarrow{[O]} CH_3COOH\ .$$

Q.61 (2)

$$CH_3COOH + CH_3-Mg-X \rightarrow CH_3-CH_3$$

Q.62 (1)



$$R–\underset{\underset{O}{||}}{C}–OR' \xrightarrow{\overset{\oplus}{OH}/H_2O} R–\underset{\underset{O}{||}}{C}–OH + R'–OH$$

Ester

Saponification Reaction

Q.63 (2)

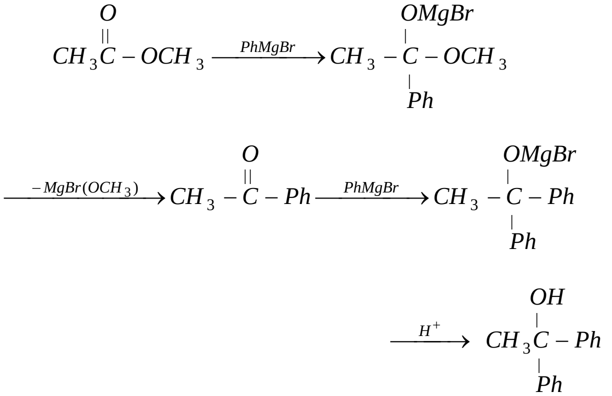
$$RCOOAg \xrightarrow{Br_2/\Delta} R–Br$$

$\downarrow$

$R^- \longrightarrow$ Intermediate

1° carbanion $\longrightarrow$ most stable $\Rightarrow$ reactivity $\uparrow$

Q.64 (1)



$$CH_3\overset{\overset{O}{||}}{C}-OCH_3 \xrightarrow{PhMgBr} CH_3-\underset{\underset{Ph}{|}}{\overset{\overset{OMgBr}{|}}{C}}-OCH_3$$

$$\xrightarrow{-MgBr(OCH_3)} CH_3-\overset{\overset{O}{||}}{C}-Ph \xrightarrow{PhMgBr} CH_3-\underset{\underset{Ph}{|}}{\overset{\overset{OMgBr}{|}}{C}}-Ph$$

$$\xrightarrow{H^+} CH_3\underset{\underset{Ph}{|}}{\overset{\overset{OH}{|}}{C}}-Ph$$

1,1-diphenylet hanol

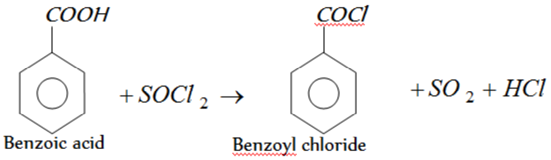
Q.65 (2)

Reactivity $\propto \delta \oplus$ character on carbon of $\underset{\underset{O}{||}}{-C-}$ group.

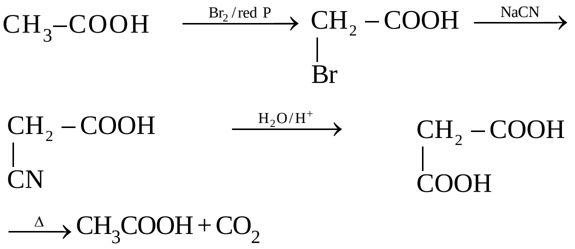
Q.66 (2)

$$CH_2=CH-COOH \xrightarrow{LiAlH_4} CH_2=CH-CH_2OH + H_2O$$

Q.67 (3)



Q.68 (1)

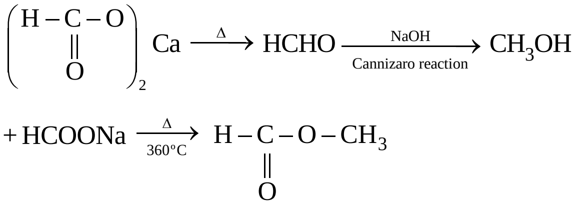


$$CH_3–COOH \xrightarrow{Br_2/red\ P} \underset{\underset{Br}{|}}{CH_2}-COOH \xrightarrow{NaCN}$$

$$\underset{\underset{CN}{|}}{CH_2}-COOH \xrightarrow{H_2O/H^+} \underset{\underset{COOH}{|}}{CH_2}-COOH$$

$$\xrightarrow{\Delta} CH_3COOH + CO_2$$

Q.69 (1)



$$\left(H-\underset{\underset{O}{||}}{C}-O\right)_2 Ca \xrightarrow{\Delta} HCHO \xrightarrow[\text{Cannizaro reaction}]{NaOH} CH_3OH$$

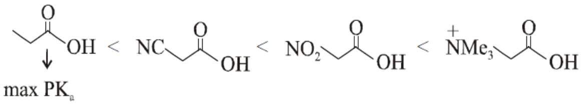
$$+ HCOONa \xrightarrow[360°C]{\Delta} H-\underset{\underset{O}{||}}{C}-O-CH_3$$

Q.70 (4)

Amide group represent by the formula $-CONH_2$

Q.71 (1)

$pK_a \uparrow$ least acidic, acidic strength



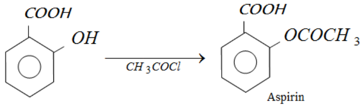
Q.72 (2)

$C_nH_{2n}O_2$ is the general formula of carboxylic acid and Esters.

Q.73 (1)

It is picric acid because it has three $-NO_2$ group are arranged which are ortho and para position

Q.74 (1)

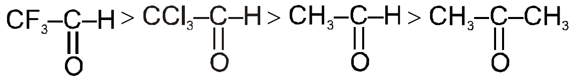


Q.75 (2)

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

EXERCISE-III (JEE MAIN LEVEL)

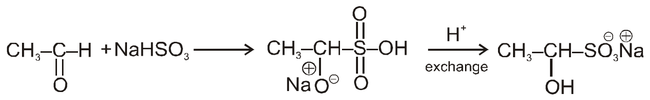
Q.1 (2)



$$CF_3-\underset{O}{\underset{\|}{C}}-H > CCl_3-\underset{O}{\underset{\|}{C}}-H > CH_3-\underset{O}{\underset{\|}{C}}-H > CH_3-\underset{O}{\underset{\|}{C}}-CH_3$$

Q.2 (3)
–I and –M group increase electrophilicity on –CHO group so rate of addition reaction increase and also increases equilibrium constant.

Q.3 (4)



$$CH_3-\underset{O}{\underset{\|}{C}}-H + NaHSO_3 \longrightarrow CH_3-\underset{Na^{\oplus}O^{\ominus}}{CH}-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-OH \xrightarrow[\text{exchange}]{H^+} CH_3-\underset{OH}{\underset{|}{CH}}-SO_3^{\ominus}Na^{\oplus}$$

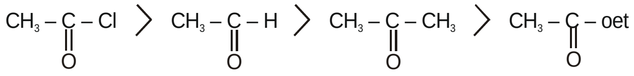
Q.4 (2)
It is protection of carbonyl compound.

Q.5 (2)
As the positive charge decreases and steric hinderance increases on carbonyl group the rate of nucleophilic addition reaction decreases.

Q.6 (2)
As the positive charge decreases and steric hinderance increases on carbonyl group the rate of nucleophilic addition reaction decreases.

Q.7 (1)
–I and –M group increase electrophilicity on –CHO group so rate of nuclephilic addition reaction increases.

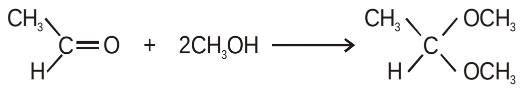
Q.8 (1)



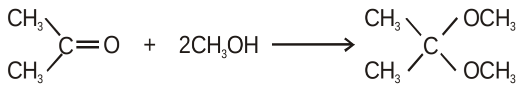
$$CH_3-\underset{O}{\underset{\|}{C}}-Cl > CH_3-\underset{O}{\underset{\|}{C}}-H > CH_3-\underset{O}{\underset{\|}{C}}-CH_3 > CH_3-\underset{O}{\underset{\|}{C}}-oet$$

Decreasing Order of reactivity towards N.A.R.

Q.9 (4)

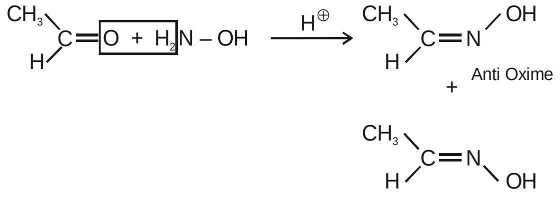


Acetal



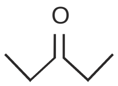
Ketal

Q.10 (1)



Q.11 (1)

Q.12 (4)

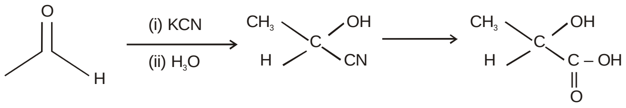


$+ NaHSO_3 \longrightarrow$ No Rxn (due to streric hindrence)

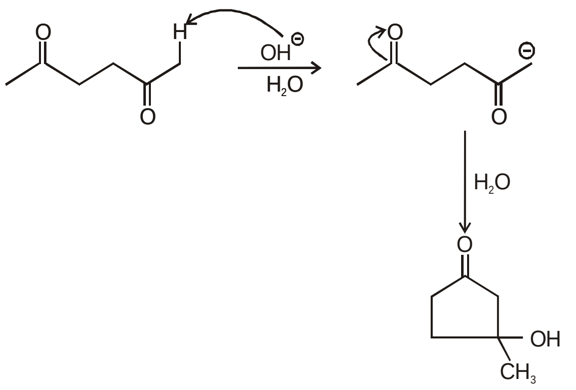
Q.13 (2)

$Ph-CH=\boxed{O+H_2}N-NH_2 \xrightarrow[-H_2O]{H} PhCH=N-NH_2$ Hydrazone

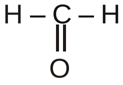
Q.14 (2)



Q.15 (2)

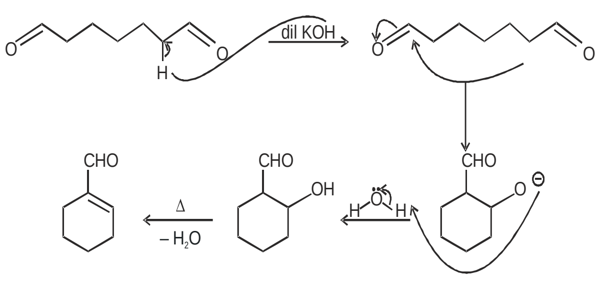


Q.16 (4)



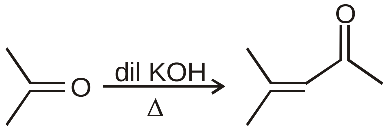
$H-\underset{\underset{O}{\|}}{C}-H$ have no α – H so do not show aldol Rx^n

Q.17 (4)

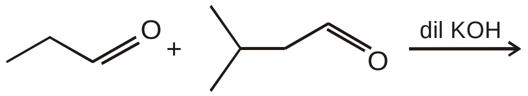


Q.18 (4)
Aldol addition are proceed in presence of Base catlyst as well as acid catalyst.

Q.19 (2)

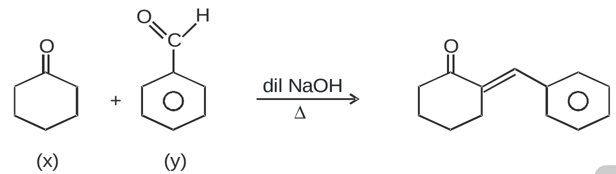


Q.20 (3)



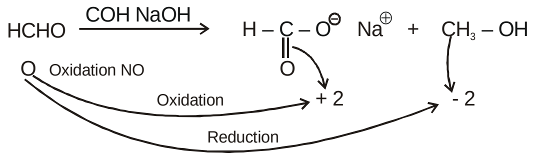
borh aldehyde having α – H So 4 product will be formed in which two self and two cross. Product will be obtained.

Q.21 (4)



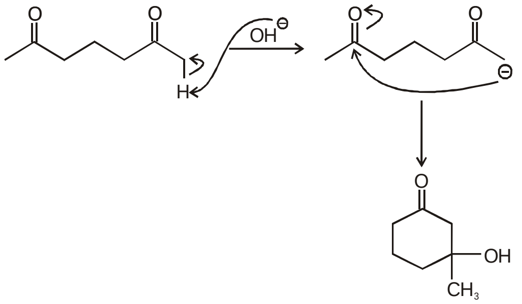
Q.22 (4)
α-hydrogen absent.

Q.23 (3)

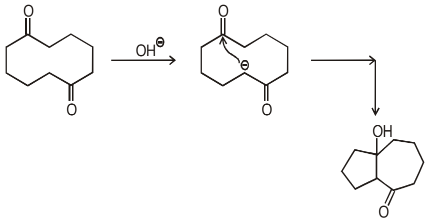


Q.24 (2)
Corbonyl Comp having no α – H gives cannizaro Rx^n

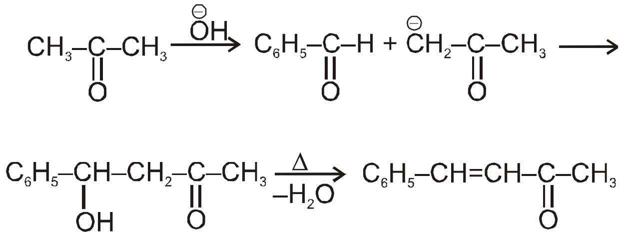
Q.25 (4)
Intramolecular aldol reaction -
(i)



(ii)



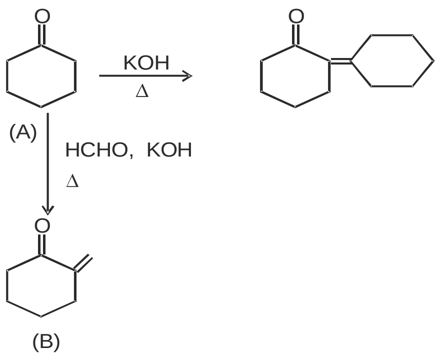
Q.26 (1)



$$CH_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{\overset{\ominus}{O}H} C_6H_5-\underset{\underset{O}{\|}}{C}-H + \overset{\ominus}{C}H_2-\underset{\underset{O}{\|}}{C}-CH_3 \longrightarrow$$

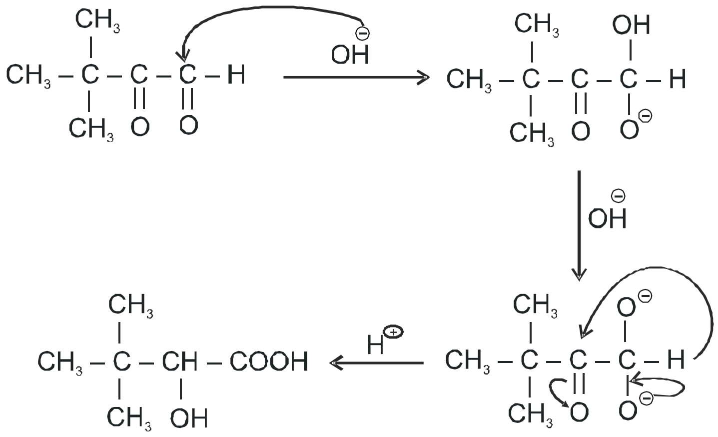
$$C_6H_5-\underset{\underset{OH}{|}}{CH}-CH_2-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[-H_2O]{\Delta} C_6H_5-CH=CH-\underset{\underset{O}{\|}}{C}-CH_3$$

Q.27 (2)

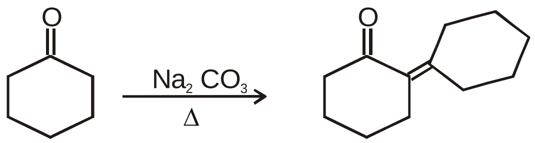


Q.28 (1,2,4)
Compound which have α-hydrogen gives aldol condensation reaction.

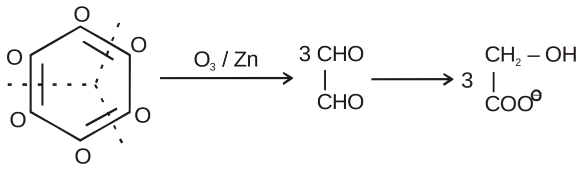
Q.29 (2)



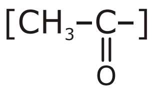
Q.30 (1)



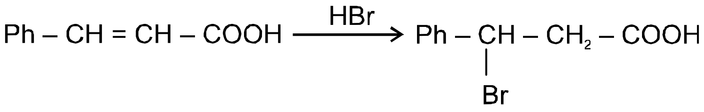
Q.31 (3)



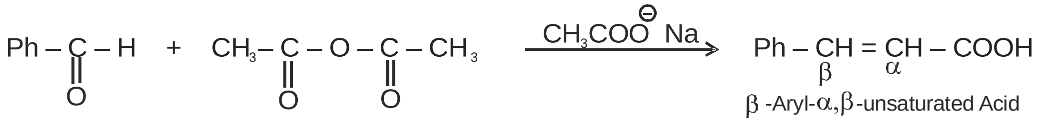
Q.32 (4)

compound in which  $[CH_3-\underset{\underset{O}{\|}}{C}-]$ group is present will react with NaoI (NaOH + I_2)

Q.33 (2)
Perkin reaction


$$Ph-CH=CH-COOH \xrightarrow{HBr} Ph-\underset{\underset{Br}{|}}{CH}-CH_2-COOH$$

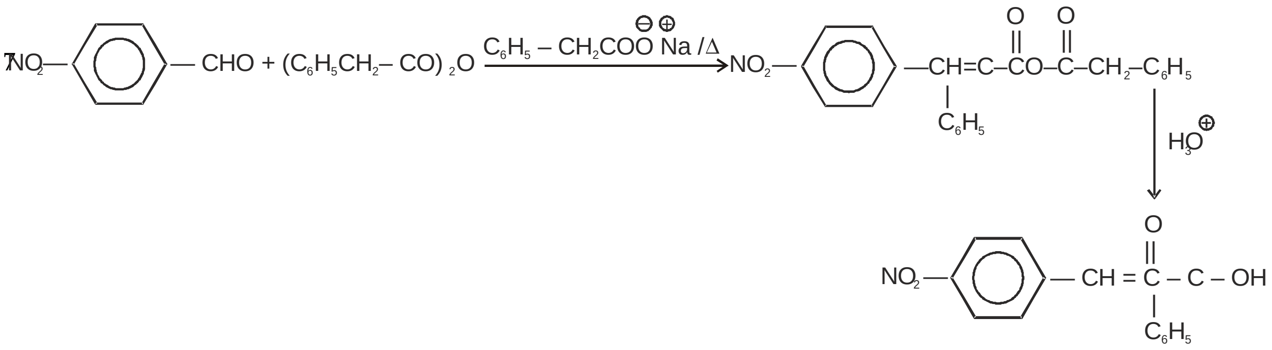
Q.34 (3)



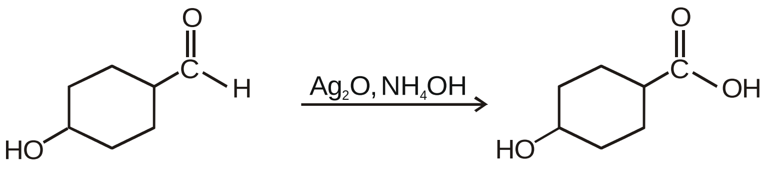
$$Ph-\underset{\underset{O}{\|}}{C}-H + CH_3-\underset{\underset{O}{\|}}{C}-O-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{CH_3COO^{\ominus}\ Na} Ph-\underset{\beta}{CH}=\underset{\alpha}{CH}-COOH$$

β -Aryl-α,β-unsaturated Acid
or
Cinnemic Acid

Q.35 (4)

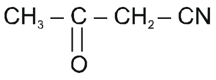


Q.36 (3)



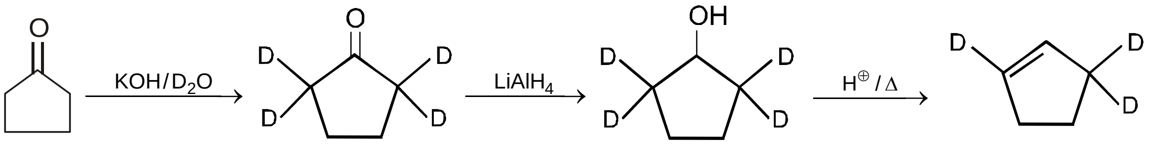
Q.37 (2)
Schiff's reagent is [P rosanilline + HCl + SO_2] which is used for different b/w Aldehyde or Ketone.

Q.38 (4)



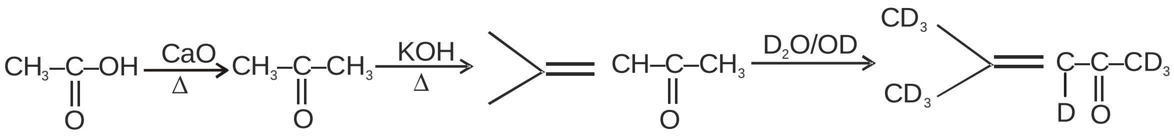
$$CH_3-\underset{\underset{O}{\|}}{C}-CH_2-CN$$

Q.39 (3)

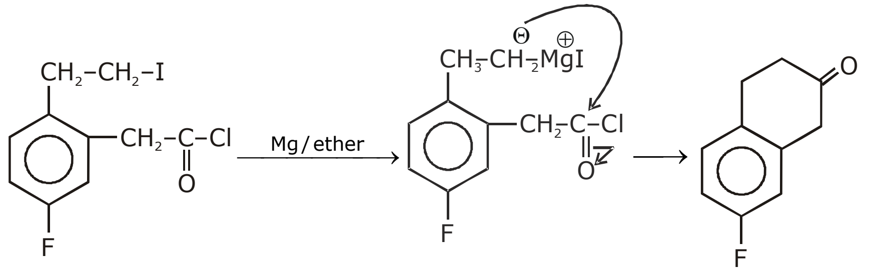


Q.40 (2)
$CH_3-CHO \longrightarrow$ negative Lucas test

Q.41 (2)



Q.42 (4)



Q.43 (1)

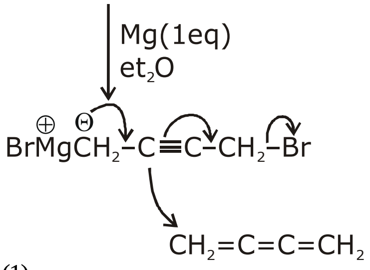
Reactivity of Alkyl halide for

R–X+mg ⟶ RMgx

⇒ (R–I > R –Br >R–Cl)

Q.44 (4)

$Br–CH_2–C≡C–CH_2–Br \xrightarrow[\substack{(excess)\\ Et_2O}]{Mg} BrMgCH_2–C≡C–CH_2MgBr$



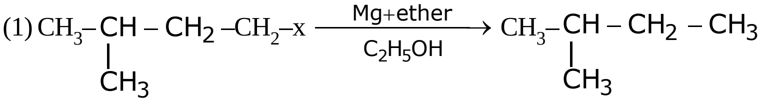
Q.45 (1)

$(CH_3)_3\,CMgCI + D_2O \longrightarrow (CH_3)_3CD$

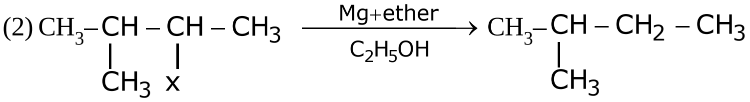
Q.46 (3)

R– Br is $CH_3 – CH_2 – Br$ which undergoes in Wurtz reaction to give the products $CH_3 – CH_2 – CH_2 – CH_3$ and $CH_3 – CH_3$

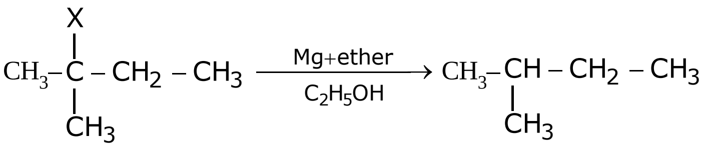
Q.47 (3)



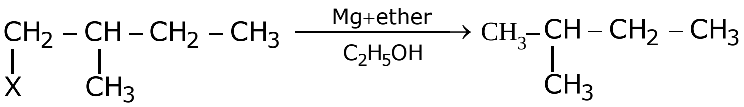
(1) $\underset{\displaystyle CH_3}{CH_3–\underset{|}{CH}} – CH_2 –CH_2–x \xrightarrow[C_2H_5OH]{Mg+ether} \underset{\displaystyle CH_3}{CH_3–\underset{|}{CH}} – CH_2 – CH_3$



(2) $CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}} – \underset{\displaystyle x}{\underset{|}{CH}} – CH_3 \xrightarrow[C_2H_5OH]{Mg+ether} CH_3–\underset{\displaystyle CH_3}{\underset{|}{CH}} – CH_2 – CH_3$

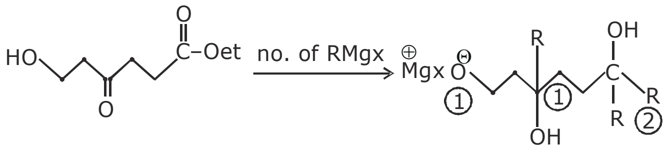
(3) 

$CH_3-\overset{X}{\underset{CH_3}{C}}-CH_2-CH_3 \xrightarrow[C_2H_5OH]{Mg+ether} CH_3-\underset{CH_3}{CH}-CH_2-CH_3$

(4) 

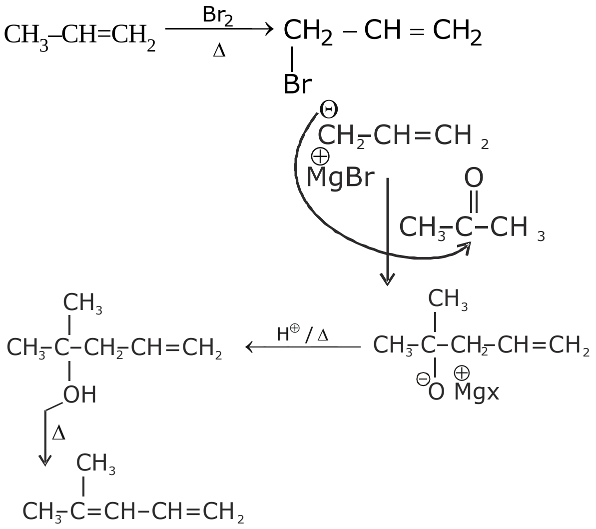
$\underset{X}{CH_2}-\underset{CH_3}{CH}-CH_2-CH_3 \xrightarrow[C_2H_5OH]{Mg+ether} CH_3-\underset{CH_3}{CH}-CH_2-CH_3$

Q.48 (1)

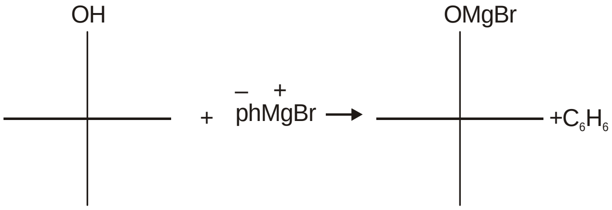


⇒ no. of G.R. (RMgx) consumed per mole compound = (4)

Q.49 (2)

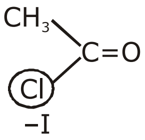


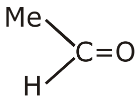
Q.50 (3)

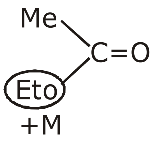


Q.51 (1)

Reactivity order of following with PhMgBr

(I) 

(ii) 

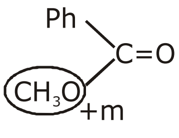
(iii) 

$\boxed{I > II > III}$

Q.52 (3)

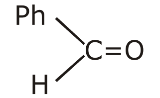
Decreasing reactivity order of following comp. toward attack of G.R.

(i)



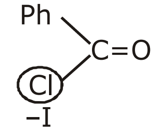
Methyl benzoate

(ii)



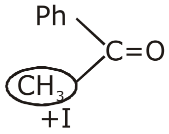
Benzaldehyde

(iii)



Benzoyl chloride

(iv)



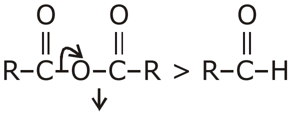
Acetopheno

$\boxed{III > II > IV > I}$

Q.53 (2)

(Reactivity order towards G.R. for $Nu^{\ominus}$ attack)

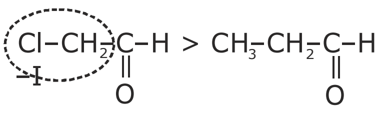
(1)



$R-\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}-R > R-\overset{O}{\overset{\|}{C}}-H$

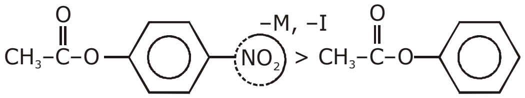
due to good leaving group

(2)



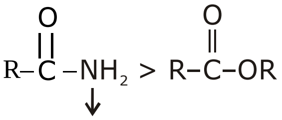
$Cl-CH_2-\underset{O}{\underset{\|}{C}}-H > CH_3-CH_2-\underset{O}{\underset{\|}{C}}-H$

(3)



$CH_3-\overset{O}{\overset{\|}{C}}-O-C_6H_4-NO_2 > CH_3-\overset{O}{\overset{\|}{C}}-O-C_6H_5$

(4)

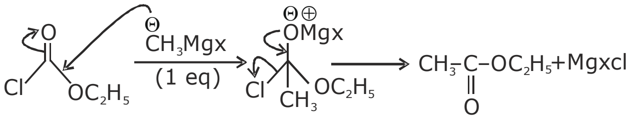


$R-\overset{O}{\overset{\|}{C}}-NH_2 > R-\overset{O}{\overset{\|}{C}}-OR$

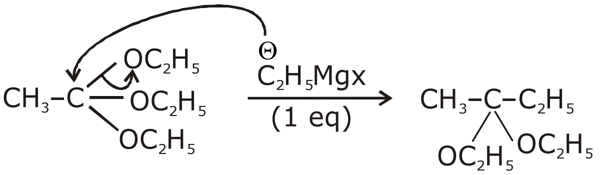
Acidic H

Q.54 (2)

(1)

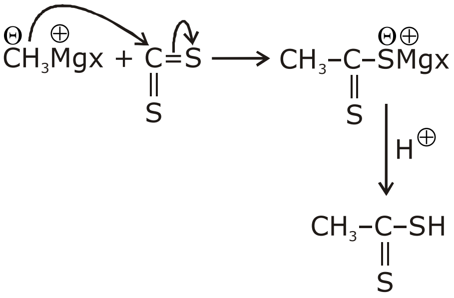


(2)



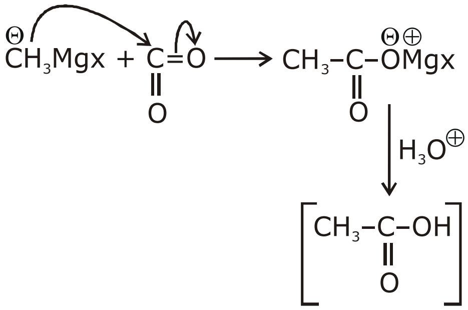
$CH_3-C(OC_2H_5)_3 \xrightarrow[(1\ eq)]{\overset{\ominus}{C_2H_5}Mgx} CH_3-C(C_2H_5)(OC_2H_5)_2$

(3)



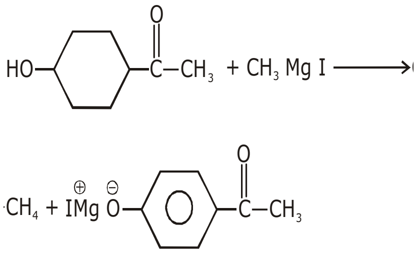
$\overset{\ominus}{CH_3}\overset{\oplus}{Mgx} + \underset{S}{\underset{\|}{C}}=S \longrightarrow CH_3-\underset{S}{\underset{\|}{C}}-\overset{\ominus\oplus}{S}Mgx \xrightarrow{H^{\oplus}} CH_3-\underset{S}{\underset{\|}{C}}-SH$

(4)



$\overset{\ominus}{CH_3}Mgx + \underset{O}{\underset{\|}{C}}=O \longrightarrow CH_3-\underset{O}{\underset{\|}{C}}-\overset{\ominus\oplus}{O}Mgx \xrightarrow{H_3O^{\oplus}} \left[CH_3-\underset{O}{\underset{\|}{C}}-OH\right]$

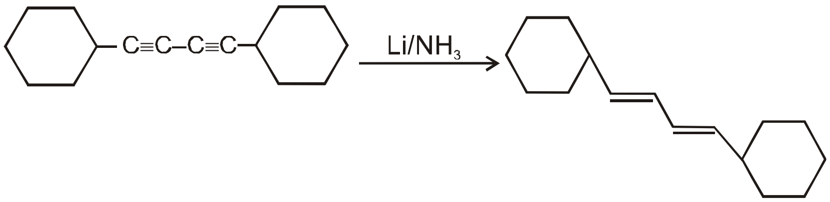
Q.55 (1)



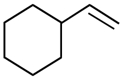
Q.56 (4)

cis-alkene formed by lindlar catalyst and trans - alkene formed by Na/NH_3

Q.57 (2)



Q.58 (2)

 has maximum heat of hydrogenation and unstabiliity.

Q.59 (4)
All reaction are correct.

Q.60 (2)

Q.61 (3)

Q.62 (4)

Q.63 (1)

Q.64 (2)

Q.65 (2)

Q.66 (3)

$$R-NC \xrightarrow{H_2/Pt} R-NH-CH_3$$

Q.67 (1)

Q.68 (1)

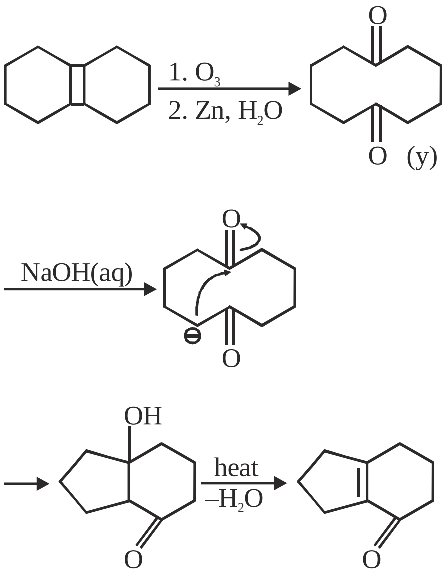
Q.69 (4)

Q.70 (4)

$$CH_3-CH_2-C\equiv CH \xrightarrow[NH_4OH]{Cu_2Cl_2} \underset{\text{Blood red Colour}}{CH_3-CH_2-C\equiv \overset{\ominus}{C}\overset{\oplus}{Cu}} + NH_4Cl + H_2O$$

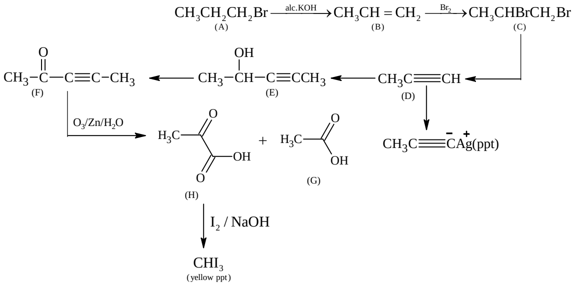
EXERCISE-IV

Q.1 (1)



The number of intramolecular aldol condensatiuon products α,β- unsaturated carbonyl compound formed from Y is1.

Q.2 0000088



Molecular weight of compound (H) = 88

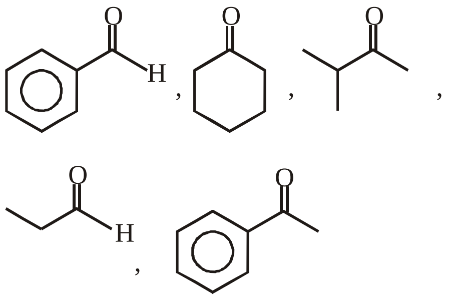
Q.3 (1)

Sec – Butyl Alcohol

Q.4 (6)

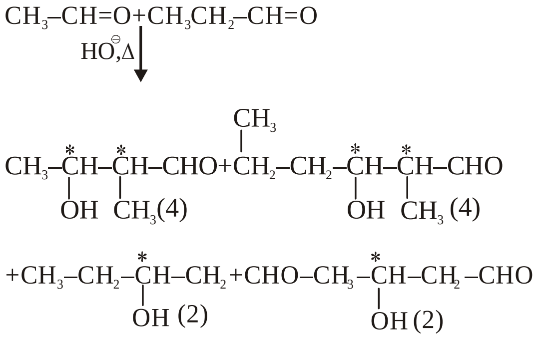
Those aldehydes which undergo disproportionation reaction in basic medium will undergo Cannizzaro reaction. If activating groups are present at ortho and para positions w.r.t. aldehyde group, these type of benzene derivatives do not undergo Cannizzaro reaction.

Q.5 (5)



Q.6 (7)

As z = 12. So z – 5 = 7.

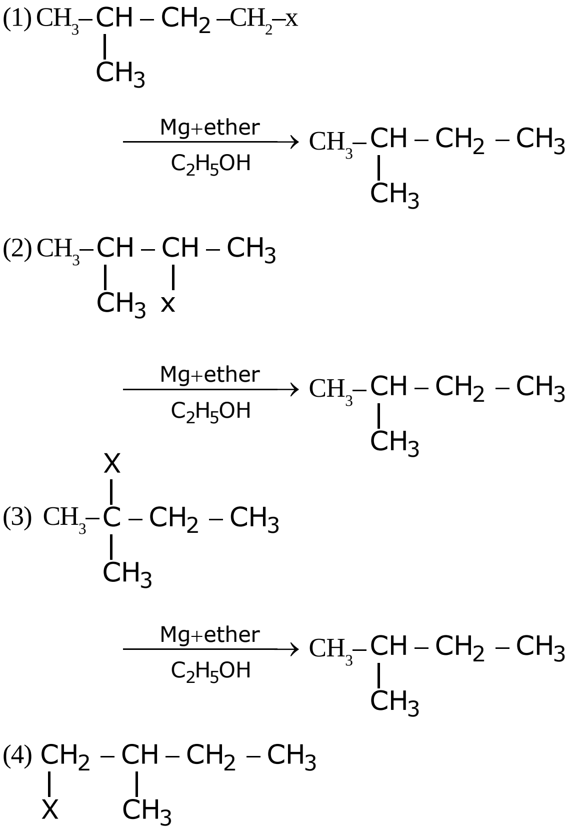


$$CH_3–CH=O+CH_3CH_2–CH=O \xrightarrow{\overset{\ominus}{HO},\Delta}$$

$$CH_3–\underset{OH}{\overset{*}{C}H}–\underset{CH_3}{\overset{*}{C}H}–CHO(4)+\overset{CH_3}{CH_2}–CH_2–\underset{OH}{\overset{*}{C}H}–\underset{CH_3}{\overset{*}{C}H}–CHO\ (4)$$

$$+CH_3–CH_2–\underset{OH}{\overset{*}{C}H}–CH_2\ (2)+CHO–CH_3–\underset{OH}{\overset{*}{C}H}–CH_2–CHO\ (2)$$

Q.7 4



(1) $CH_3–\underset{CH_3}{CH}–CH_2–CH_2–x$

$$\xrightarrow[C_2H_5OH]{Mg+ether} CH_3–\underset{CH_3}{CH}–CH_2–CH_3$$

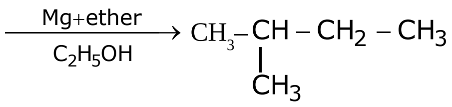
(2) $CH_3–\underset{CH_3}{CH}–\underset{x}{CH}–CH_3$

$$\xrightarrow[C_2H_5OH]{Mg+ether} CH_3–\underset{CH_3}{CH}–CH_2–CH_3$$

(3) $CH_3–\overset{X}{\underset{CH_3}{C}}–CH_2–CH_3$

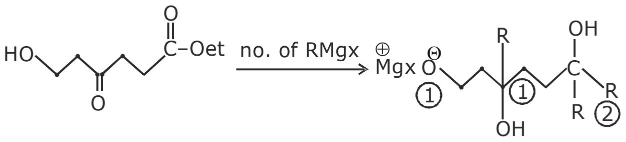
$$\xrightarrow[C_2H_5OH]{Mg+ether} CH_3–\underset{CH_3}{CH}–CH_2–CH_3$$

(4) $\underset{X}{CH_2}–\underset{CH_3}{CH}–CH_2–CH_3$



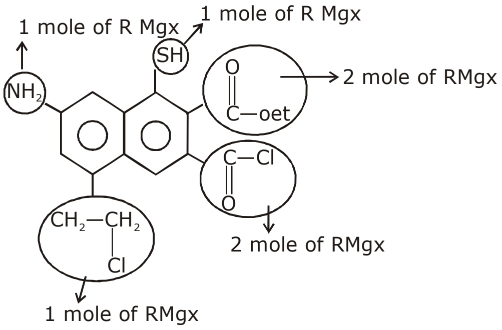
$\xrightarrow[C_2H_5OH]{Mg+ether} CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_3$

Q.8 4



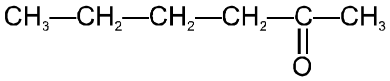
⇒ no. of G.R. (RMgx) consumed per mole compound = (4)

Q.9 7

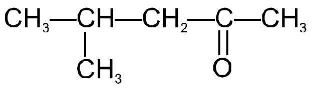


Total No. of R Mgx consumed in above comp = 7

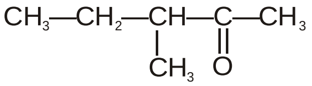
Q.10 4



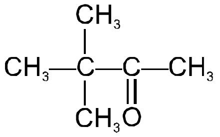
$CH_3-CH_2-CH_2-CH_2-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3$



$CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3$



$CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3$



$CH_3-\overset{\displaystyle CH_3}{\overset{|}{\underset{\displaystyle CH_3}{\underset{|}{C}}}}-\underset{\displaystyle O}{\underset{\|}{C}}-CH_3$

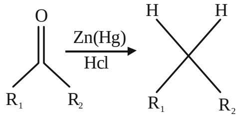
Q.11 (1) **Q.12** (4) **Q.13** (4) **Q.14** (2) **Q.15** (4)
Q.16 (3)

PREVIOUS YEAR'S

MHT CET

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

The reduction of carbonyl groups (in aldehydes and ketones) to methylene groups with zinc amalgam and hydrochloric acid is know as the celmmesion reduction reaction

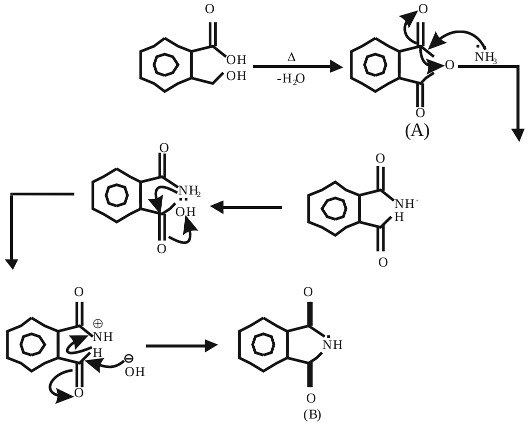


Q.27 (1)
Q.28 (1)
Q.29 (1)
Q.30 (1)
Q.31 (1)
Q.32 (1)
Q.33 (2)
Q.34 (1)
Q.35 (1)
Q.36 (1)
Q.37 (3)
Q.38 (2)
Q.39 (4)
Q.40 (3)
Q.41 (2)
Q.42 (2)
Q.43 (2)
Q.44 (4)
Q.45 (1)
Q.46 (3)
Q.47 (4)

Q.48 (1)

Abstraction of - H atom attached to carbonyl group in an aldehyde, is much easier than the abstraction from bulkier alkyl group attached to carbonyl group in a ketone

Q.49 (2)

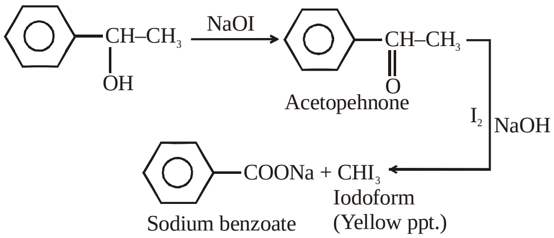


NEET

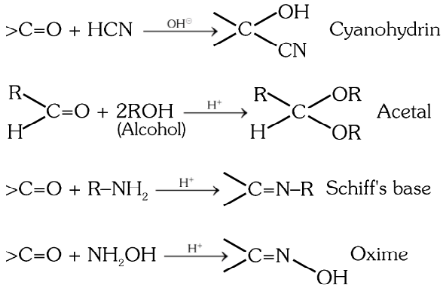
Q.1 (1)

Option (1) is secondary alcohol which on oxidation gives phenylmethyl ketone (Acetophenone). This on reaction with I_2 and NaOH form iodoform and sodium benzoate.

$2NaOH + I_2 \rightarrow NaOI + NaI + H_2O$



Q.2 (4) **Q.3** (3) **Q.4** (3) **Q.5** (4)
Q.6 (3)



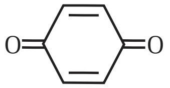
Q.7 (4)

Boiling point of comparable molecular mass molecules
R – OH > Aldehyde – Ketone > Alkane
H-bonding Dipole-dipole interaction Non-polar
(strong molecular (weak molecular association) association)

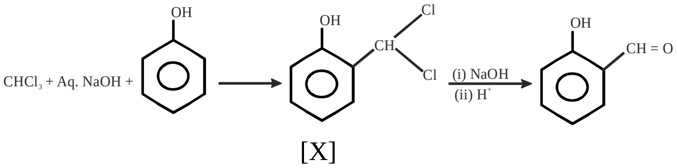
Q.8 (2)
Q.9 (3)
Q.10 (2)

JEE MAIN

Q.1 (3)

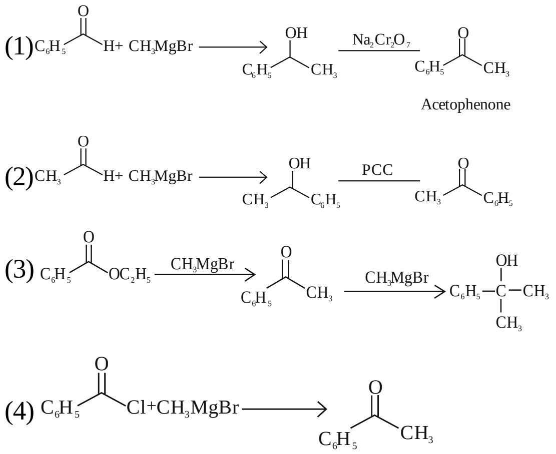


Q. 2 (3)

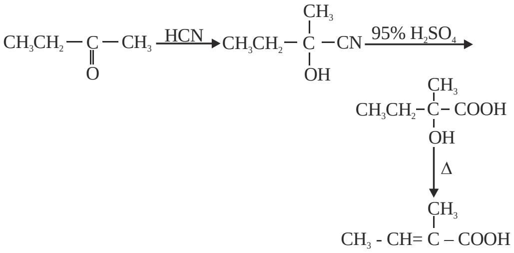


[X]

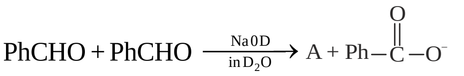
Q.3 (3)



Q.4 (1)

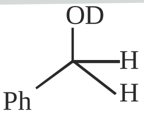


Q.5 (3)
Q.6 (1)



$$PhCHO + PhCHO \xrightarrow[\text{in } D_2O]{NaOD} A + Ph-\overset{O}{\overset{\|}{C}}-O^-$$

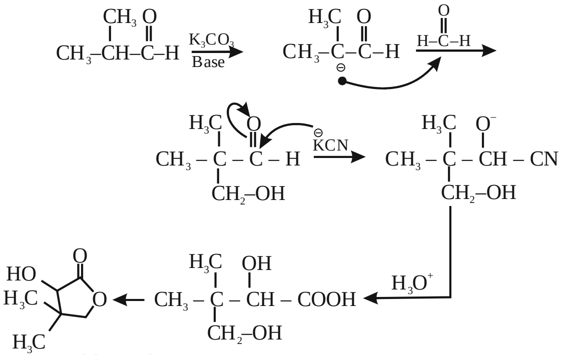
(Oxidised product)

A : 

[Cannizzaro reaction]

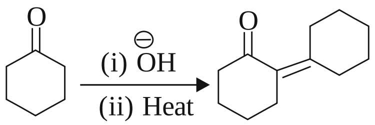
(Reduced product)

Q.7 (3)

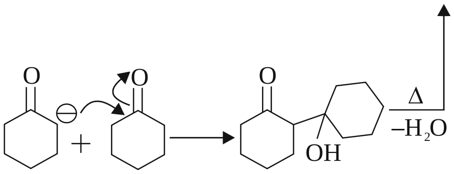


Stable product

Q.8 (4)

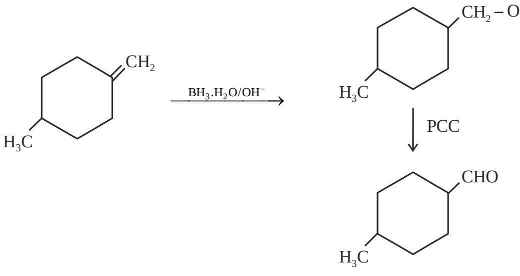


Case of aldol condensation

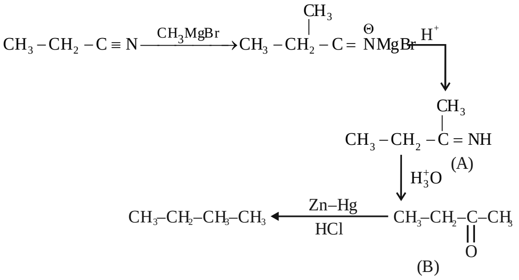


$4\pi e^-$

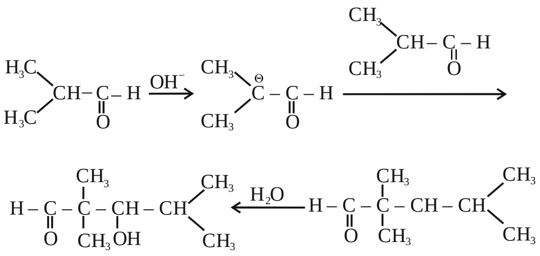
Q.9 (3)



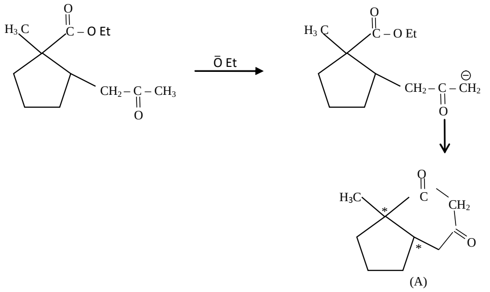
Q.10 (1)



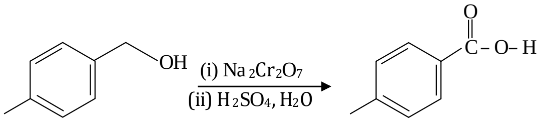
Q.11 (2)



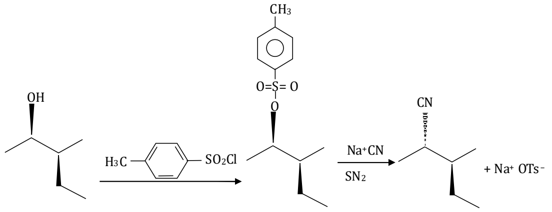
Q.12 [2]



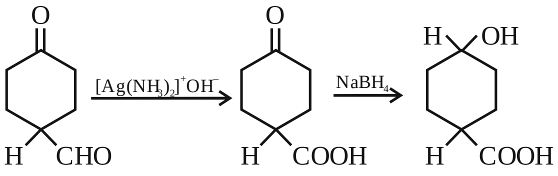
Q.13 (4)



Q.14 (2)

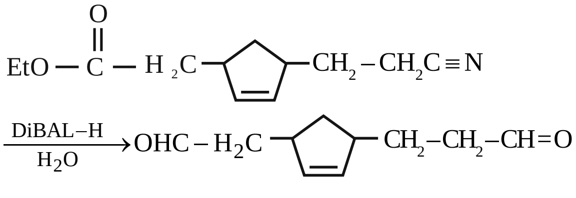


Q.15 (3)



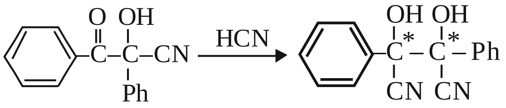
(A) (B)

Q.16 (1)



Q.17 (3)

The number of stereoisomer formed in a reaction.



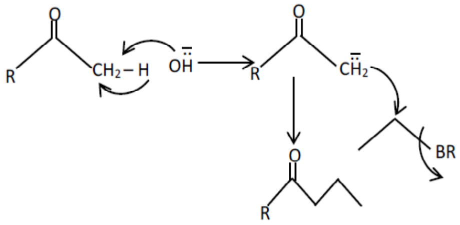
Two chiral centre
n=2

No. of chiral centre $= 2$

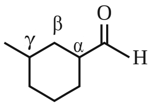
No. of stereoisomer $= 2^n - 2^{\frac{n}{2}-1} = 2^2 - 2^{\frac{2}{2}-1} = 2^2 - 2^0$

No. of stereoisomer = 3

Q.18 (3)



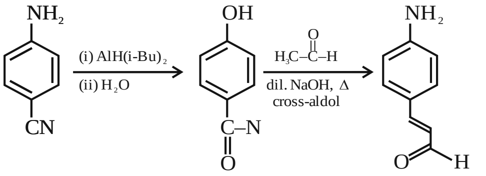
Q.19 (1)



Methyle group at γ position

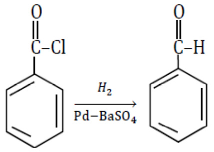
γ methylcyclohexane carboldehyde

Q.20 (2)



Q.21 (1)

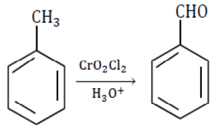
(A)



Rosenmund reaction

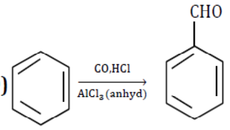
(B) $CH_3 - CN \xrightarrow[H_3O^+]{SnCl_2HCl} CH_3 - CHO$ **Stephen reacti**

(C)



Etard reaction

(D)

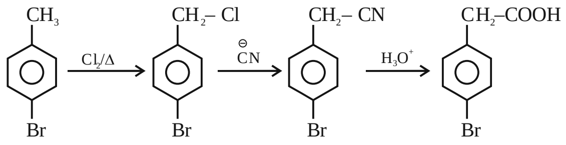


Gatterman Koch reacti

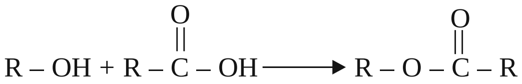
Q.22 (1)

Even number of carbon atoms are symmetrical, so they are tight packed in crystal lattice. Hence have high lattice energy. We need higher temperture to change their state. So they have higher m.p.

Q.23 (3)



Q.24 (1)



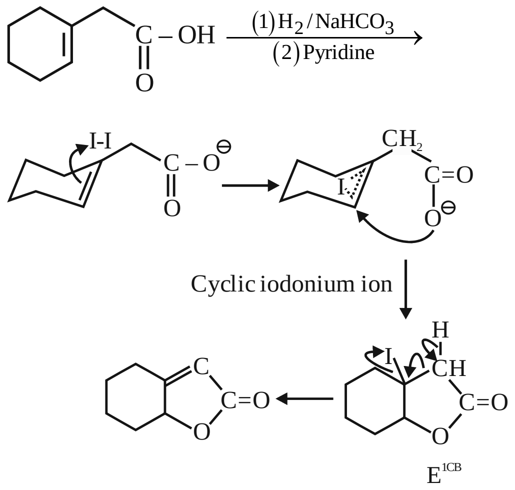
$$R - OH + R - \overset{\overset{\displaystyle O}{||}}{C} - OH \longrightarrow R - O - \overset{\overset{\displaystyle O}{||}}{C} - R$$

Nucleophilic acyl substitution

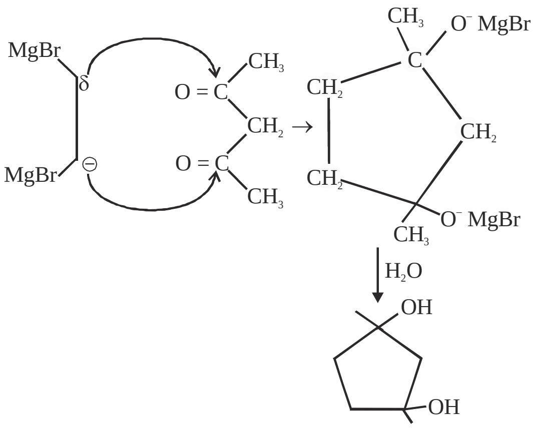
Electron withdrawing group on carboxylic acid will increase rate of esterification.

Option (A) is correct.

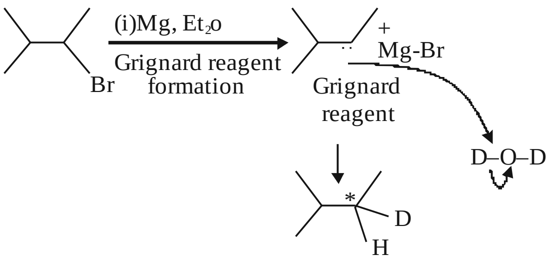
Q.25 (3)



Q.26 (1)

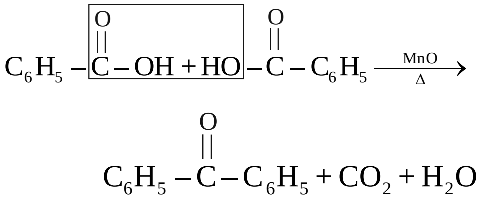


Q.27 (3)



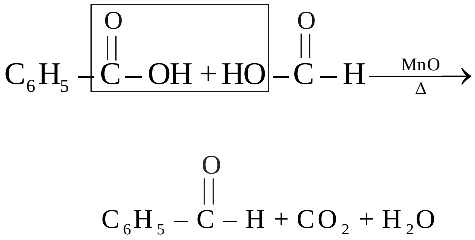
Now marked carbon become assymetric (chiral) carbon hence, Molecule become chiral.

Q.28 (3)



$$C_6H_5-\boxed{\overset{O}{\overset{||}{C}}-OH+HO}-\overset{O}{\overset{||}{C}}-C_6H_5\xrightarrow[\Delta]{MnO}$$

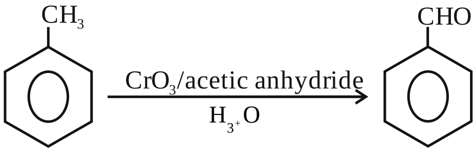
$$C_6H_5-\overset{O}{\overset{||}{C}}-C_6H_5+CO_2+H_2O$$



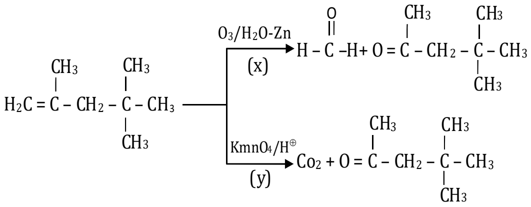
$$C_6H_5-\boxed{\overset{O}{\overset{||}{C}}-OH+HO}-\overset{O}{\overset{||}{C}}-H\xrightarrow[\Delta]{MnO}$$

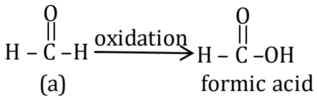
$$C_6H_5-\overset{O}{\overset{||}{C}}-H+CO_2+H_2O$$

Q.29 (2)



Q.30 (4)





$$\underset{(a)}{H-\overset{O}{\overset{||}{C}}-H}\xrightarrow{oxidation}\underset{\text{formic acid}}{H-\overset{O}{\overset{||}{C}}-OH}$$

Amines

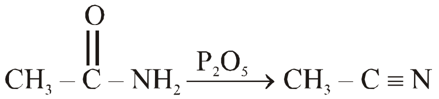
EXERCISE-I (MHT CET LEVEL)

Q.1 (2)

Urea is obtained by heating ammonium cyanate

$$NH_4CNO.\xrightarrow{\Delta} NH_2CONH_2$$

Q.2 **(2)**



$$CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-NH_2 \xrightarrow{P_2O_5} CH_3-C\equiv N$$

Ethanamide Acetenitrile

Q.3 (3)

Q.4 (4)

Q.5 (1)

Q.6 (2)

Q.7 (1)

Q.8 (2)

Q.9. **(1)**

Q.10 **(2)**

Q.11 (2)

Q.12 (2)

Q.13 (2)

Q.14 **(1)**

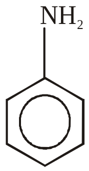
Q.15 **(2)**

Q.16 **(2)**

Q.17 **(4)**

Q.18 (4)

When aniline is treated with nitrous acid in the presence of HCl, then benzene diazonium chloride is obtained.



$$+ NaNO_2 + 2HCl \longrightarrow$$

$C_6H_5N = NCl + NaCl + 2H_2O$

(Benzene diazonium chloride)

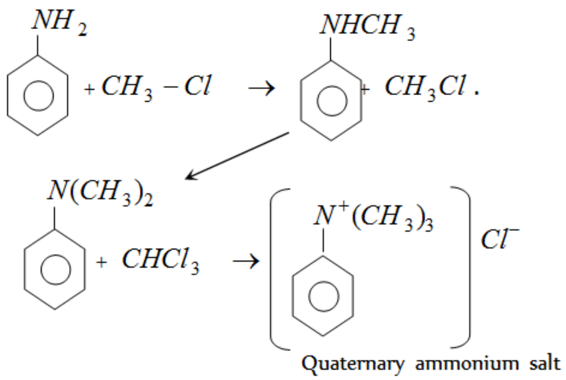
Q.19 (4)

$$C_6H_5NH_2 + COCl_2 \rightarrow C_6H_5NH.COCl$$
$$C_6H_5NH_2 + HCl \rightarrow C_6H_5NCO + HCl$$

Q.20 (3)

Hinsberg Test

Q.21 (3)

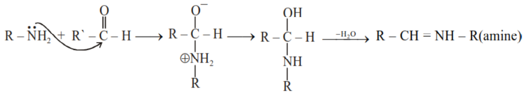


Q.22 (1) $C_6H_5-NH_2 + CHCl_3 + 3KOH \rightarrow$

$$C_6H_5NC + 3KCl + 3H_2O$$

Phenyl Isocyanide

Q.23 (2)



$$R-\ddot{N}H_2 + R`-\overset{\overset{\displaystyle O}{\|}}{C}-H \longrightarrow R-\underset{\underset{\displaystyle R}{|}}{\underset{\oplus NH_2}{\underset{|}{\overset{\overset{\displaystyle O^-}{|}}{C}}}}-H \longrightarrow R-\underset{\underset{\displaystyle R}{|}}{\underset{NH}{\underset{|}{\overset{\overset{\displaystyle OH}{|}}{C}}}}-H \xrightarrow{-H_2O} R-CH=NH-R(\text{amine})$$

Q.24 (4)

$$R-NH_2 + CS_2 \xrightarrow{HgCl_2} R-SCH$$

Hoffmann mustrd oil reaction.

Q.25 (1)

When ethylamine is heated with sodium metal, then hydrogen gas is evolved.

$$2C_2H_5NH_2 + 2Na \rightarrow$$

$$2C_2H_5\overline{N}HNa^+ + H_2\uparrow$$

Q.26 (2)

Q.27 (2)

Q.28 **(4)**

Q.29 **(3)**

Q.30 **(4)**

Q.31 (1)

$-CCl_3$, $-NO_2$ and $-\overset{+}{N}H_3$ are m-directing in nature

Q.32 (1)

Q.33 (4)

Q.34 (3)

Q.35 **(1)**

Q.36 **(4)**

Q.37 **(2)**

EXERCISE-II (NEET LEVEL)

Q.1 (2)

Q.2 (2)

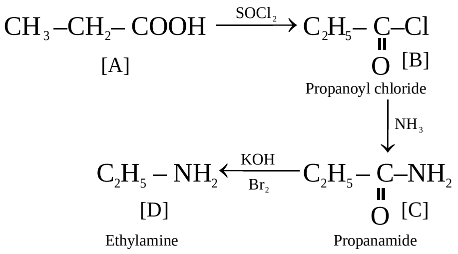
Q.3 **(2)**

Q.4 (3)

$$CH_3-N \overset{\rightarrow}{\equiv} C \xrightarrow{LiAlH_4} \underset{(Sec.Amine)}{CH_3-NH-CH_3}$$

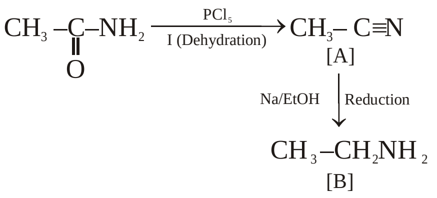
Isocyanide on reduction gives secondary amine.

Q.5 (4)



$$\begin{tikzcd} \underset{[A]}{CH_3-CH_2-COOH} \arrow[r, "SOCl_2"] & \underset{\text{Propanoyl chloride}}{C_2H_5-\underset{O}{\underset{\|}{C}}-Cl\ [B]} \arrow[d, "NH_3"] \\ \underset{\text{Ethylamine}}{\underset{[D]}{C_2H_5-NH_2}} & \underset{\text{Propanamide}}{C_2H_5-\underset{O}{\underset{\|}{C}}-NH_2\ [C]} \arrow[l, "KOH"', "Br_2"] \end{tikzcd}$$

Q.6 (3)



$$\begin{tikzcd} CH_3-\underset{O}{\underset{\|}{C}}-NH_2 \arrow[r, "PCl_5", "\text{I (Dehydration)}"'] & \underset{[A]}{CH_3-C\equiv N} \arrow[d, "Na/EtOH"', "Reduction"] \\ & \underset{[B]}{CH_3-CH_2NH_2} \end{tikzcd}$$

$$\underset{\text{Alkyl isocyanide}}{R-CN} \xrightarrow{Na/EtOH} \underset{\text{p-amine}}{R-CH_2-NH_2} \text{ [Mendius reaction]}$$

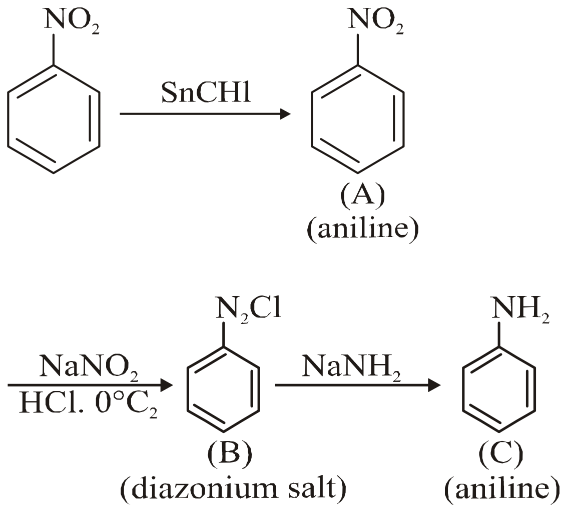
Q.7 (3)

$$C_2H_5NC \xrightarrow{Reduction} C_2H_5NHCH_3$$

Q.8 (2)

This reaction is used for preparation of primary aliphatic amines.

Q.9 (4)



Q.10 (4)

$$CH_3CH \xrightarrow{Na/C_2H_5OH} \underset{(A)}{CH_3CH_2NH_2}$$

$$\xrightarrow{HNO_2} \underset{(B)}{CH_3CH_2OH} \xrightarrow[573K]{Cu} \underset{(C)}{CH_3CHO}$$

Q.11 (1)

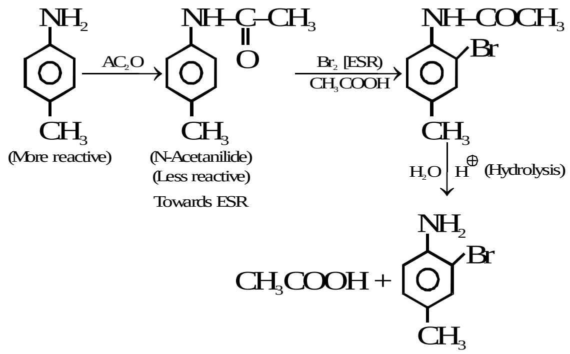
Q.12 (2)

Q.13 (4)

Q.14 (3)

Q.15 (2)

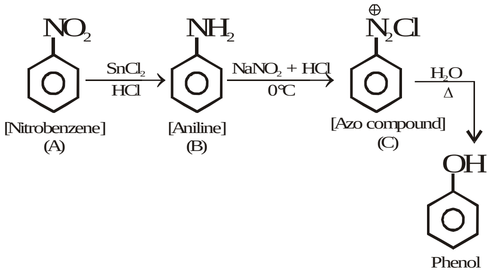
Q.16 (3)



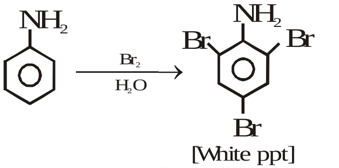
Q.17 (2)

Q.18 (2)

$$A \xrightarrow[HCl]{SnCl_2} B \xrightarrow[0^\circ C]{NaNO_2 + HCl} C \xrightarrow[\Delta]{H_2O} C_6H_5OH$$



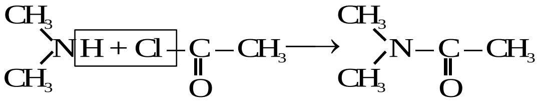
Q.19 (3)



[White ppt]
[2,4,6-Tribromoaniline]

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

Q.20 (3)



$$\underset{CH_3}{\overset{CH_3}{>}}N\boxed{H + Cl}-\underset{\underset{O}{\|}}{C}-CH_3 \longrightarrow \underset{CH_3}{\overset{CH_3}{>}}N-\underset{\underset{O}{\|}}{C}-CH_3$$

Dimethyl aniline + Acetyl-Chloride   N,N-dimethyl acetamide

Q.21 (3)

(A) Ammonical $AgNO_3$ [Tollen's reagent]

$$RCHO + 2[Ag(NH_3)_2]^{+} + 3\overset{\ominus}{O}H$$
$$\downarrow$$
$$4NH_3 + 2H_2O + 2Ag + RCO\overset{\ominus}{O}$$

(B) HIO_4

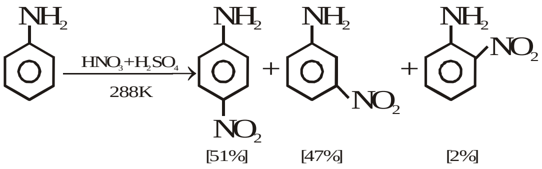
$$>\underset{\underset{OH}{|}}{C}-\underset{\underset{OH}{|}}{C}< + HIO_4 \longrightarrow >\underset{\underset{O}{\|}}{C} + >\underset{\underset{O}{\|}}{C}$$

Vicinal alcohol

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

(D) $R-NH_2 + CHCl_3 + NaOH \rightarrow R-N\equiv C + 3KCl + 3H_2O$

Q.22 (3)

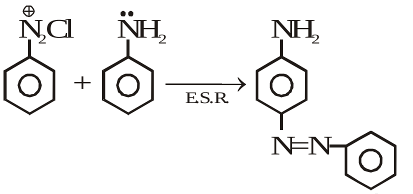


In strongly acidic medium, aniline is protonated to form the anilinium ion which is meta-directly so beside o & p derivatives, meta derivative is also formed.

Q.23 (4)

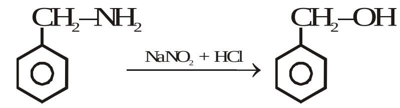
(1) >C=NH–R structure will be Shiff's Base.

(2)



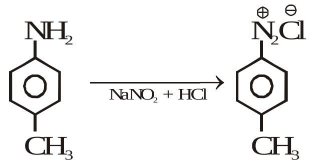
p-amino azobenzene
[Yellow - Dye]

(3)



Benzyl amine   Benzyl alcohol

(4)

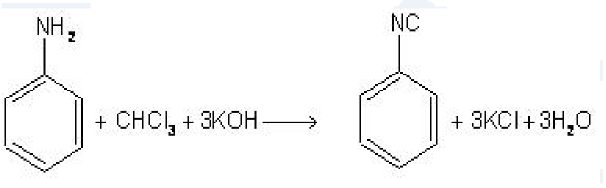


p-Methyl aniline   p-Methyl benzene diazonium chlorine

Q.24 (3)

$$C_6H_5NH_2 \xrightarrow[0^oC-5^oC]{NaNO_2\,/\,HCl} \underset{(X)}{C_6H_5N_2^{+}Cl^{-}}\;\underset{(Y)}{C_6H_5}NO_2 \xrightarrow[H_2O]{HNO_2} + N_2 + HCl$$

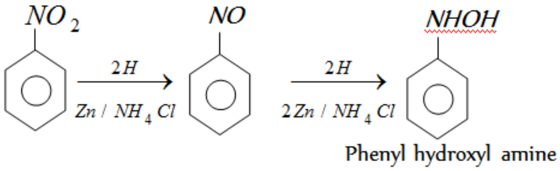
Q.25 (2)



Primary amines (aromatic or aliphatic) on warming with chloroform and alcoholic KOH, gives carbylamine having offensive smell. This reaction is called carbylamine reaction.

Q.26 (3)

Q.27 (4)

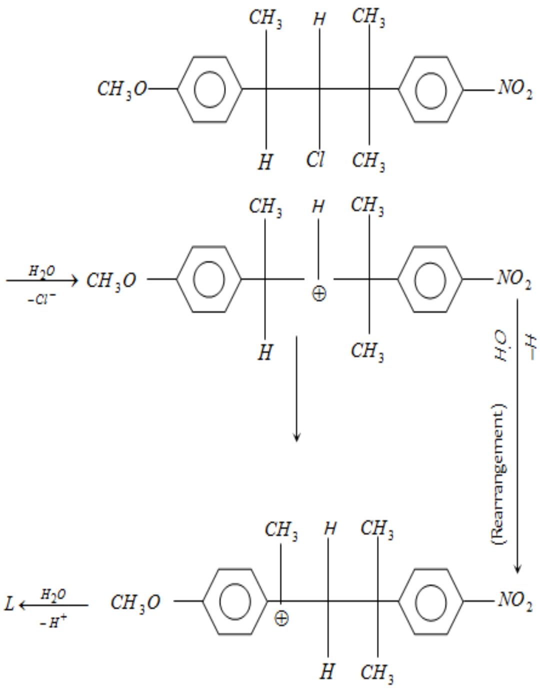


Q.28 (2)

$$\underset{}{CH_3CN} + CH_3MgI \rightarrow \underset{(A)}{(CH_3)_2CNMgI} \xrightarrow[-NH_3]{H_2O/H^+}$$

$$\underset{(B)}{CH_3COCH_3} + Mg\begin{cases} OH \\ I \end{cases}$$

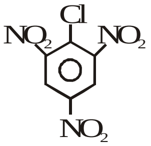
Q.29 (1)



Q.30 (2)

Q.31 (1)

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



*storng –M of 3 NO_2 group
*Less E density in ring.
*More attack of nucleophile

Q.32 (1)

Q.33 **(2)**

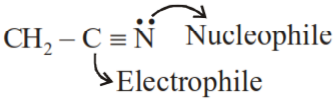
Four 1^o amines are possible

$CH_3CH_2CH_2CH_2NH_2, (CH_3)_2CHCH_2NH_2$,

$CH_3CH(NH_2)CH_2CH_3, (CH_3)_3CNH_2$

Opticaly active

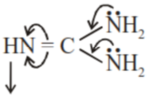
Q.34 (1)



Q.35 (3)

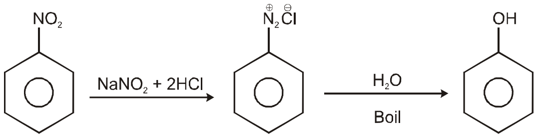
Nitrogen can not be peuta valent.

Q.36 (1)



Electron – density will be maximum at this position.

Q.37 (1)



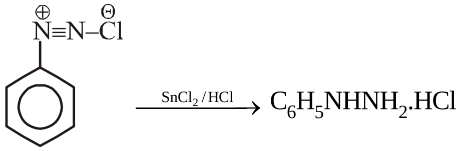
Q.38 (3)

In alkylation of benzene polyalkylated products are formed.

Q.39 (4)

Nitration of aniline is electrophilic substitution.

Q.40 (4)



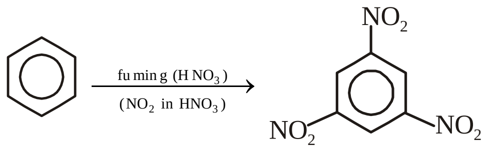
Q.41 (2)

Direct iodination of benzene is not possible because Phenyl iodide is reduced to C_6H_6 by HI.

Q.42 (1)

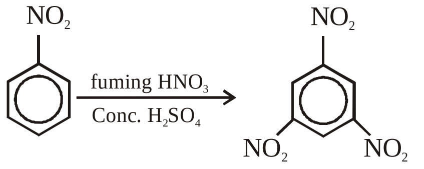
$-NO_2$ is a metadirecting de activating group..

Q.43 (3)



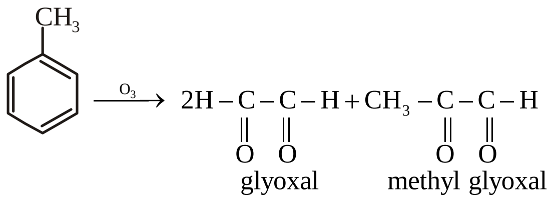
135 Trinibro benzene

Q.44 (2)



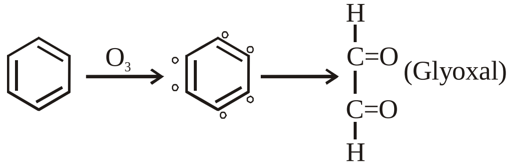
Trinitro benzene

Q.45 (3)



$$\xrightarrow{O_3} 2H-\underset{\underset{O}{\|}}{C}-\underset{\underset{O}{\|}}{C}-H+CH_3-\underset{\underset{O}{\|}}{C}-\underset{\underset{O}{\|}}{C}-H$$

Q.46 (4)



Q.47 (3)
Aromatic and aliphatic alcohols can be distinguished by $FeCl_3$ test.

Q.48 (3)

Q.49 (3)

EXERCISE-III (JEE MAIN LEVEL)

Q.1 (2)

$RCN \xrightarrow{\text{Reduction}} R-CH_2-NH_2$ [1° Amine]

$RCN \xrightarrow[\text{(ii) } H_2O]{\text{(i) } CH_3MgBr} CH_3-\underset{\underset{O}{\|}}{C}-$ [Methyl ketone]

$R-NC \xrightarrow{\text{Hydrolysis}} R-NH_2+HCOOH$ [1 Amine]

$R-NH_2 \xrightarrow{HNO_2} R-OH+N_2-H_2O$
[Alcohol]

Q.2 (3)

(i) $R–X+NH_3 \longrightarrow R–NH_2+HX$

(ii) $R-CH=NOH \xrightarrow[\text{Na[Alcohol]}]{[H]} R-$ $CH_2=NH_2+H_2O$

(iii) $R–C≡N+H_2O \xrightarrow{H^{\oplus}} RCOOH+NH_3$

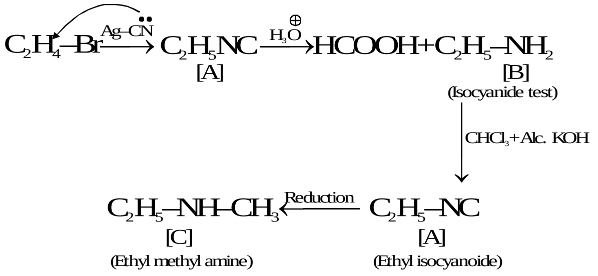
(iv)

$$R-\underset{\underset{O}{\|}}{C}-NH_2+4[H] \xrightarrow{LiAlH_4} R-CH_2-NH_2+H_2O$$

Q.3 (2)

$$\underset{\text{Acetamide}}{CH_3CONH_2} \xrightarrow{P_2O_5} \underset{\text{Acetonitrile}}{CH_3-C\equiv N}+H_2O.$$

Q.4 (3)



Q.5 (2)

$C_2H_5–NH_2+HNO_2 \rightarrow C_2H_5OH+N_2+H_2O$ [Alcohol]
$C_2H_5–NH_2+C_6H_5CHO \rightarrow C_2H_5–N=CH–C_6H_5+H_2O$

[Shifts base]
$C_2H_5NH_2+NOCl \rightarrow C_2H_5Cl+N_2+H_2O$

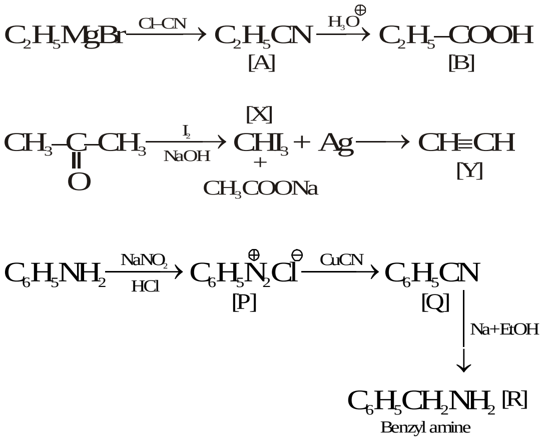
$$C_2H_5NH_2+C_6H_5SO_2Cl \rightarrow C_2H_5NH-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-C_6H_5$$

Q.6 (1)

Q.7 (3)

	Test G	Group
(I)	Iodoform test	$CH_3-\underset{\underset{O}{\|}}{C}-$ & $CH_3-\underset{\underset{OH}{|}}{CH}-$
(II)	Victor mayer test	1°, 2° & 3° alcohol
(III)	Carbyl amine test	Primary amine
(IV)	Libermann's reaction	Phinolic compound

Q.8 (1)



$$C_2H_5MgBr \xrightarrow{Cl-CN} \underset{[A]}{C_2H_5CN} \xrightarrow{H_3O^{\oplus}} \underset{[B]}{C_2H_5-COOH}$$

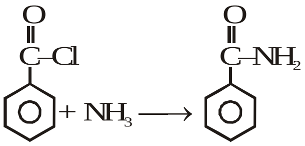
$$CH_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[NaOH]{I_2} \underset{+\;CH_3COONa}{\overset{[X]}{CHI_3}} + Ag \longrightarrow \underset{[Y]}{CH\equiv CH}$$

$$C_6H_5NH_2 \xrightarrow[HCl]{NaNO_2} \underset{[P]}{C_6H_5\overset{\oplus}{N}_2\overset{\ominus}{Cl}} \xrightarrow{CuCN} \underset{[Q]}{C_6H_5CN} \xrightarrow{Na+EtOH} C_6H_5CH_2NH_2\ [R]$$

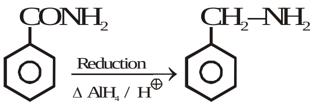
Benzyl amine

Q.9 (3)

(I)



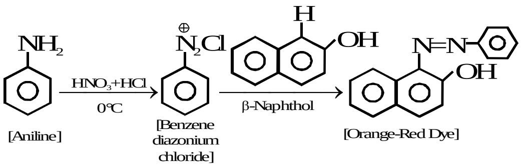
(II)



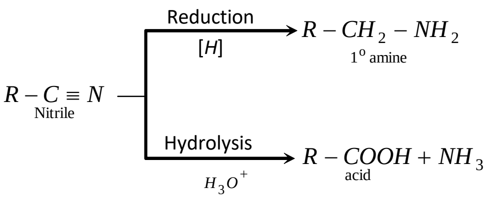
(III) $C_6H_5-OH+NH_3 \xrightarrow[\Delta]{ZnCl_2} C_6H_5NH_2+H_2O$

(IV) $PhCO-O-COPh+NH_3 \rightarrow PhCONH_2+PhCOOH$

Q.10 (4)



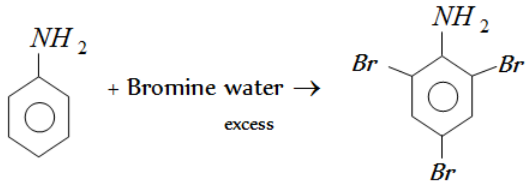
Q.11 (2)



Q.12 (4)

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

Q.13 (4)

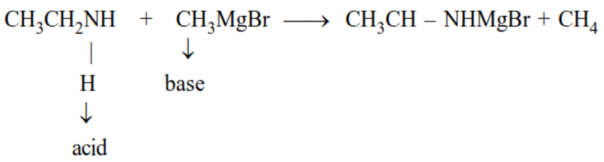


Q.14 (2)

$CH_3NH_2 + CHCl_3 + 3KOH \longrightarrow CH_3NC + 3KCl + 3H_2O$

Carbylamine reaction.

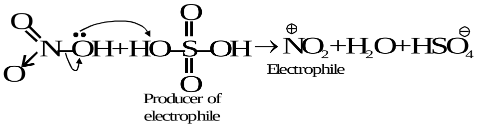
Q.15 (4)



$$CH_3CH_2NH + CH_3MgBr \longrightarrow CH_3CH-NHMgBr + CH_4$$

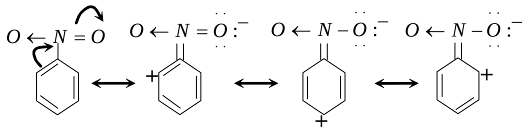
Q.16 (4)

Q.17 (4)



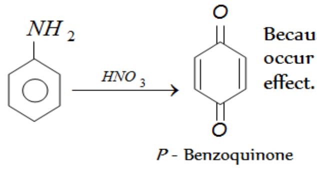
$$O_2N-\ddot{O}H + HO-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-OH \rightarrow \overset{\oplus}{N}O_2 + H_2O + HS\overset{\ominus}{O_4}$$

Q.18 (2)



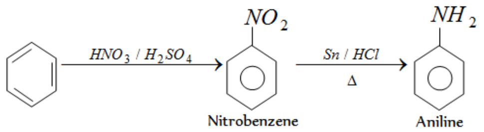
Presence of $-NO_2$ group decreases electron density at *o*- and *p*- positions. Hence, incoming electrophile goes to m position. Therefore it is m-directing group.

Q.19 (3)



Because oxidation of aniline occur in absence of making effect.

Q.20 (2)



Q.21 (4)

Presence of a nitro–group deactivates a ring towards electrophilic substitution.

Q.22 (3)

Q.23 (1)

Q.24 (1)

Q.25 (2)

Q.26 (4)

Allyl isocyanide. $CH_2 = CH - CH_2 - N \equiv C$

Q.27 (2)

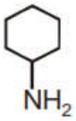
Q.28 (4)

Order of basicity of ethyl amines.

$(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3 > C_6H_5NH_2$

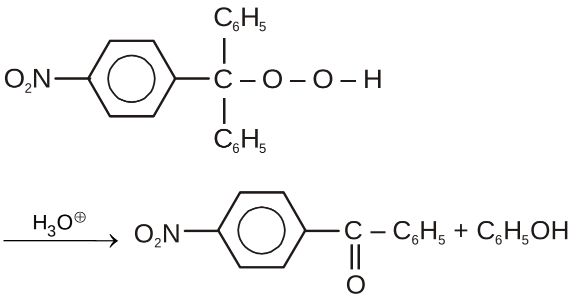
Q.29 (2)

Q.30 (3)



→ No resonance, more availability of cone – pair.

Q.31 (3)



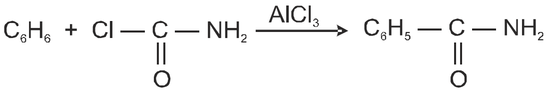
Q.32 (1)

Reactivity towards bromination ∝ Stability of arenium ion.

Q.33 (2)

In sulphonation SO_3 is electrophile species.

Q.34 (2)



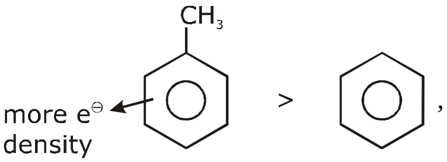
$$C_6H_6 + Cl-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{AlCl_3} C_6H_5-\underset{\underset{O}{\|}}{C}-NH_2$$

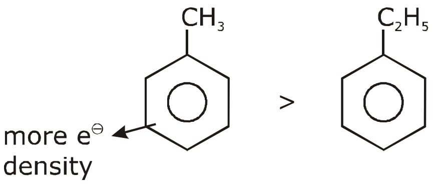
Q.35 (1)

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

Q.36 (1,2)

Reactivity order for E.S.R.





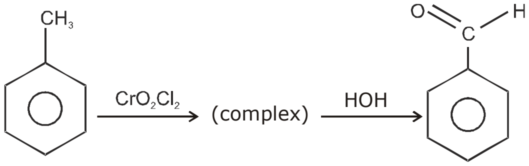
Q.37 (2,3)

They are activating groups.

Q.38 (2)

Because rate of S_N2 Ar is – F > – Cl > – Br > – I

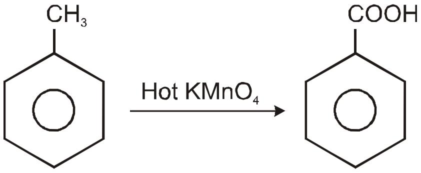
Q.39 (2)



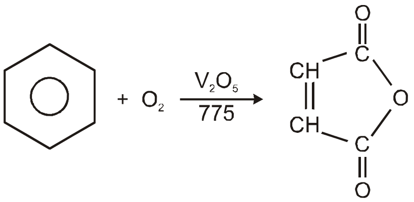
Q.40 (2)

– M of $-NO_2$ at – Cl is best in B.

Q.41 (3)



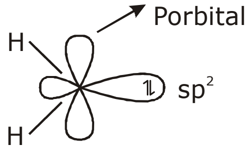
Q.42 (4)



Q.43 (1)
It is nucleophillic aromatic substitution reaction.

Q.44 (4)
S_N2 Ar is obtained.

Q.45 (1)
$\odot\ CH_2$
Single carbene → two non bonding electron are present in one sp^2 hybridized orbital.

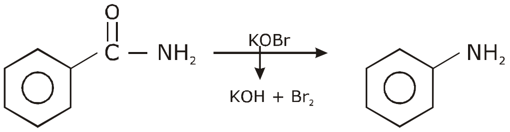


Q.46 (4)
Secondary amine are not gives. Carbylamine reaction/ isocyanide test.

Q.47 (1)
Sec. amine does not gives Hoffmann'scarbyl amine test.

Q.48 (2)
NH_4HS is selective reducing agent.

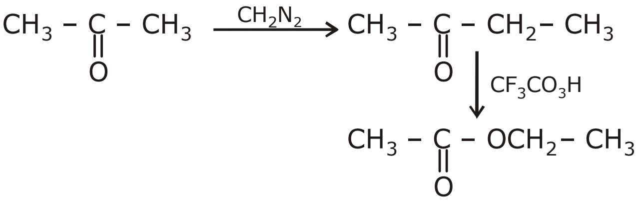
Q.49 (2)



Q.50 (4)

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

Q.51 (3)



$$CH_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow{CH_2N_2} CH_3-\underset{\underset{O}{\|}}{C}-CH_2-CH_3 \xrightarrow{CF_3CO_3H} CH_3-\underset{\underset{O}{\|}}{C}-OCH_2-CH_3$$

EXERCISE-IV

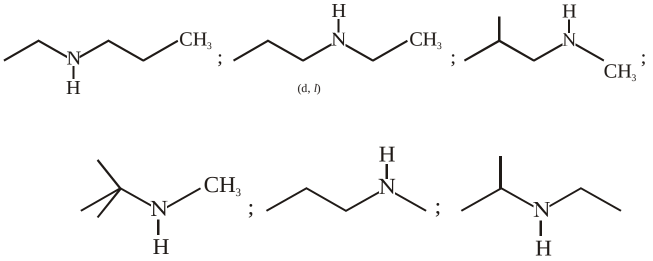
Q.1 (3)

Electron donating effect of – CH_3 group decreases electrophillicity of diazonium cation whereas electron with drawing effect of – NO_2 groups increases its electrophillicity increasing reactivity for diazocoupling. (II) , (IV) are more reactive than (I) whareas (III) , (V) & (VI) are less reactive than (I) **.**

Q.2 1,4,8,7

Q.3 (7)

Secondary amines form sulphonamides that do not dissolve in KOH solution.



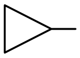
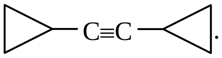
Q.4 (8)

$$C_3H_5-Br \xrightarrow{Mg} C_3H_5MgBr \xrightarrow{CO_2} C_3H_5-COOMgBr$$

$$\downarrow H_2O/H^+$$

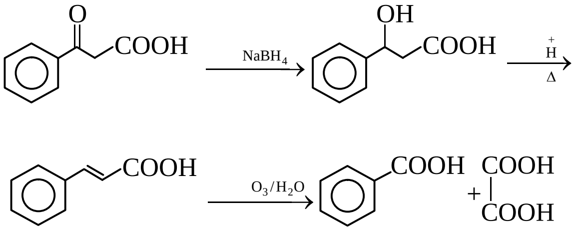
$$C_3H_5COOH$$

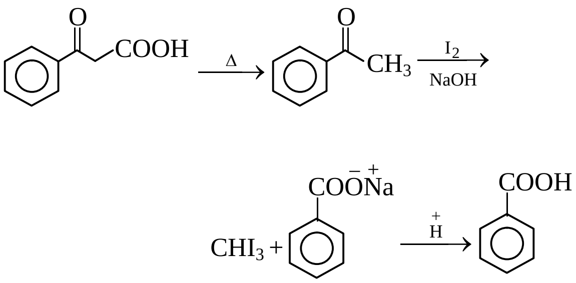
(B)

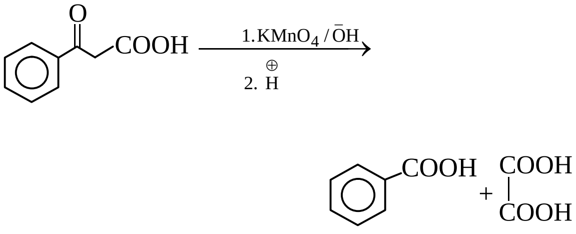
So B can be  COOH . So structure of compound A is .

No. of secondary hydrogens in A = 8

Q.5 (3)

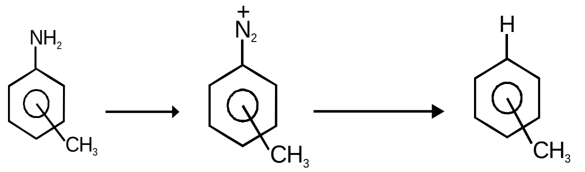






Q.6 (4)
All carboxylic acids and phenols are soluble in aqueous NaOH. Four compounds are soluble in aqueous NaOH.

Q.7 03



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

Q.8 (4) **Q.9** (4) **Q.10** (1)
Q.11 (2) **Q.12** (2) **Q.13** (1)

PREVIOUS YEAR'S

MHT CET

Q.1 (2)

Q.2 (4)

Q.3 (3)

Q.4 (4)

Q.5 (2)

Q.6 (1)

Q.7 (3)

Q.8 (1)
Q.9 (2)
Q.10 (1)
Q.11 (3)
Q.12 (2)
Q.13 (3)
Q.14 (4)
Q.15 (1)
Q.16 (4)
Q.17 (4)
Q.18 (1)
Q.19 (2)
Q.20 (2)
Q.21 (3)

Q.22 (3)

Q.23 (1)

Q.24 (1)

Q.25 (1)
Q.26 (3)
Q.27 (2)
Q.28 (4)
Q.29 (3)
Q.30 (3)
Q.31 (4)
Q.32 (3)
Q.33 (4)
Q.34 (3)

Q.35 (1)
$C_6H_5NH_2$ and C_6H_5 $NHCH_3$ are less basic then $C_2H_5NH_2$ and $(C_2H_5)_2$ NH it is due to the delocalisation of lone pair of electrons Of N- atom over the benzene ring.
Next C_6H_5 $NHCH_3$ is little more basic than C_6H_5 NH_2 it is due to the +/ I- effect of the CH_3 Group. Among C_2H_5 NH_2 and $(C_2H_5)_2$ NH,
$(C_2H_5)_2$ NH is more basic than C_2H_5 NH_2due to greater +/I-effect of two C_2H_5 group
By combinig above facts the relative basic strength or given amines decreases as:

$$(C_2H_5)_2NH > C_2H_5NH_2 > C_2H_5NHCH_3 > C_6H_5NH_2$$

Q.36 (2)

$$\underset{\text{Benzene diazonium chloride}}{C_6H_5N_2^+Cl^-} \xrightarrow{HBF_4} C_6H_5N_2^+\ BF_4^- \xrightarrow[\Delta]{NaNO_2/Cu}$$

$$\underset{\text{Nitro benzene}}{C_6H_5NO_2} \xrightarrow{Sn/HCl} \underset{\text{Aniline}}{\underset{C}{C_6H_5NH_2}}$$

Q.37 (3)

Q.38 (3)

Q.39 (3)

Q.40 (4)

Q.41 (3)

Q.42 (3)

Q.43 (2)

Q.44 (2)

Q.45 (1)

PREVIOUS YEAR'S

MHT PREVIOUS YEAR'S

Q.1 (2)

Q.2 (4)

Q.3 (3)

Q.4 (4)

Q.5 (2)

Q.6 (1)

Q.7 (3)

Q.8 (1)

Q.9 (2)

Q.10 (1)

Q.11 (3)

Q.12 (2)

Q.13 (3)

Q.14 (4)

Q.15 (1)

Q.16 (4)

Q.17 (4)

Q.18 (1)

Q.19 (2)

Q.20 (2)

Q.21 (3)

Q.22 (3)

Q.23 (1)

Q.24 (1)

Q.25 (1)

Q.26 (3)

Q.27 (2)

Q.28 (4)

Q.29 (3)

Q.30 (3)

Q.31 (4)

Q.32 (3)

Q.33 (4)

Q.34 (3)

Q.35 (1)

$C_6H_5NH_2$ and C_6H_5 $NHCH_3$ are less basic then $C_2H_5NH_2$ and $(C_2H_5)_2$ NH it is due to the delocalisation of lone pair of electrons Of N- atom over the benzene ring.

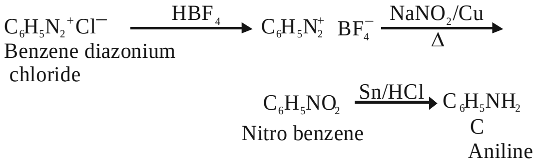
Next C_6H_5 $NHCH_3$ is little more basic than C_6H_5 NH_2 it is due to the +/ I- effect of the CH_3 Group. Among C_2H_5 NH_2 and $(C_2H_5)_2$ NH,

$(C_2H_5)_2$ NH is more basic than C_2H_5 NH_2due to greater +/I-effect of two C_2H_5 group

By combinig above facts the relative basic strength or given amines decreases as:

$(C_2H_5)_2 NH > C_2H_5NH_2 > C_2H_5 NHCH_3 > C_6H_5NH_2$

Q.36 (2)



Q.37 (3)

Q.38 (3)

Q.39 (3)

Q.40 (4)

Q.41 (3)

Q.42 (3)

Q.43 (2)

Q.44 (2)

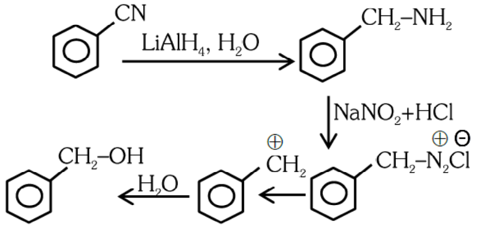
Q.45 (1)

PREVIOUS YEAR'S

NEET

AMINES

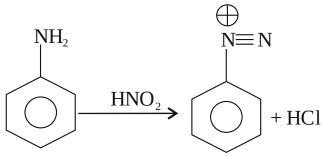
Q.1 (4)
Q.2 (1)
Q.3 (2)
Q.4 (3)



Q.5 (2)

$$R-NH_2 \xrightarrow{HNO_2} R-\overset{\oplus}{N}_2$$

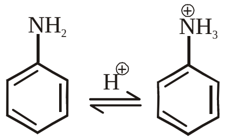
Alkyl diazonium ion (unstable)



Aryl diazonium ion stabe at low temperature (0–5ºC)

AROMATIC COMPOUND

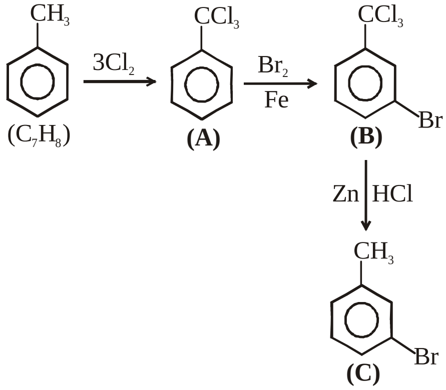
Q.6 (4)



Anilinium ion

$-\overset{\oplus}{N}H_3$ is m-directing, hence besides para (51%) and ortho (2%), meta product (47%) is also formed in significant yield.

Q.7 (3)

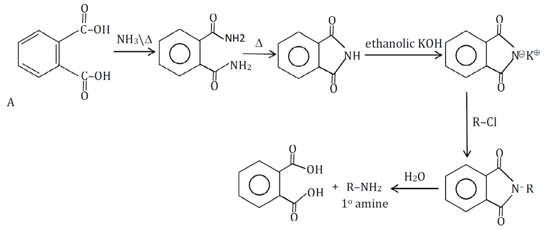


So, the correct option is (3).

JEE MAIN

AMINES

Q.1 (3)



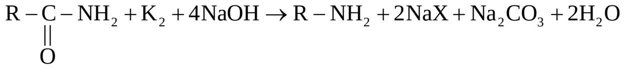
Gabrial pthalimide reaction

Q.2 (3)

(1) Benzenesulphonyl chloride → Hinsberg reagent

Hinsberg reagent is use to distinguish between 1°, 2°, 3° amines

(2) Hoffmann bromamide reaction → Known reaction of Isocyanates reaction



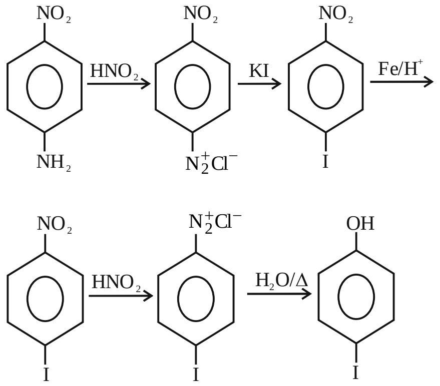
$$R-\underset{\underset{O}{\|}}{C}-NH_2 + K_2 + 4NaOH \rightarrow R-NH_2 + 2NaX + Na_2CO_3 + 2H_2O$$

(3) Carbylamine reaction → It is used for test of primary amine

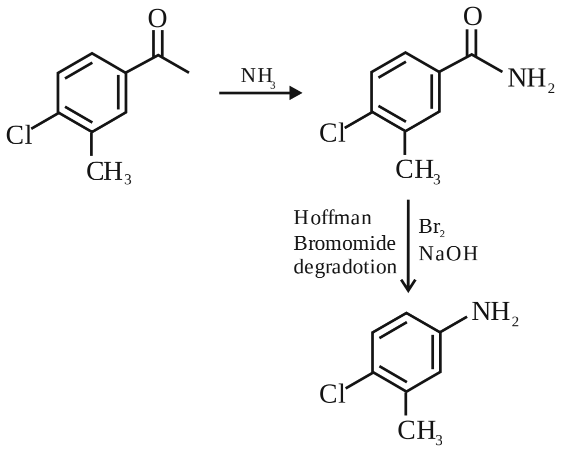
$R-NH_2 + CHCH_3 + 3KOH \rightarrow RNC + 3KCl + H_2O$

(4) Hoffmann orientation → An Saytzeff rule

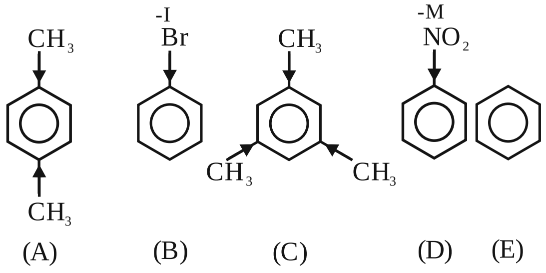
Q.3 (2)



Q.4 (3)

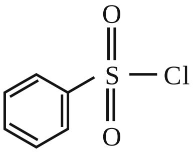


Q.5 (2)



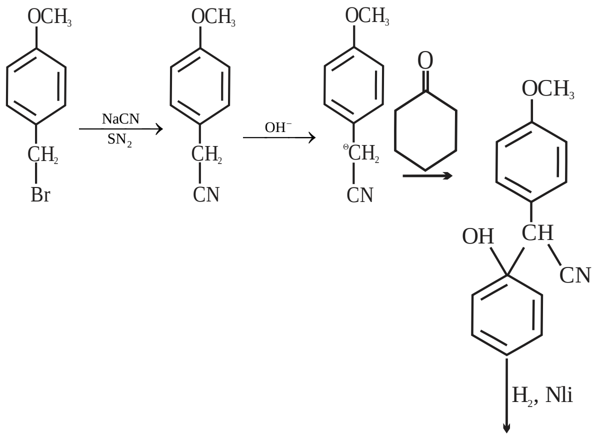
NO_2 - deactivating Br - deactivating
CH_3 - activating

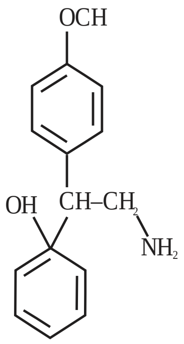
Q.6 (1)
Hinsberg reagent



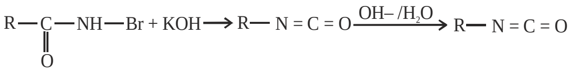
Benzene sulfonyl chloride is called Hinsberg reagent it is used to detect primary, secondary and teritary amine.

Q.7 (4)



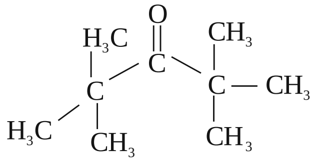


Q. 8 (3)



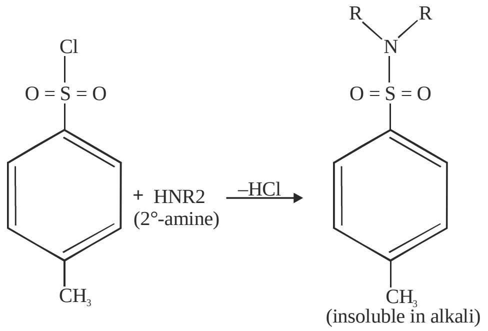
$$R-\underset{\underset{O}{\|}}{C}-NH-Br + KOH \longrightarrow R-N=C=O \xrightarrow{OH^-/H_2O} R-N=C=O$$

Q.9 (3)
Enamine formation is an example of nucleophilic addition elimination reaction



Since is ketonecarbonyl group is highly sterically hindered hence attack of nucleophile will not be possible.

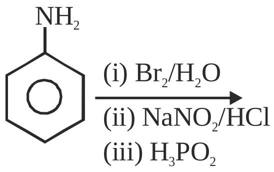
Q.10 (3)

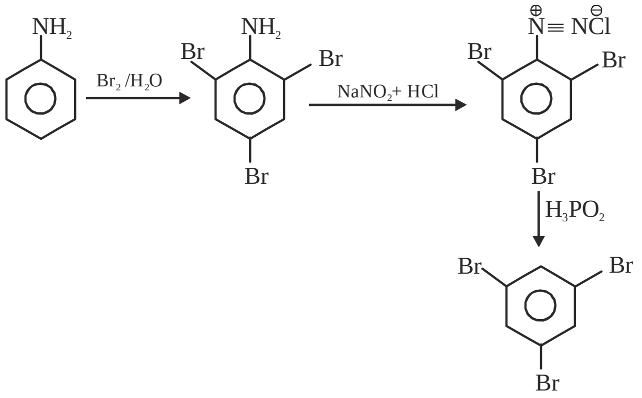


Q.11 (4)

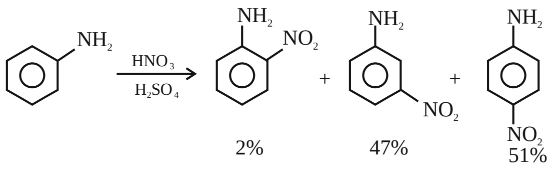
Q.12 (3)

Explanation :



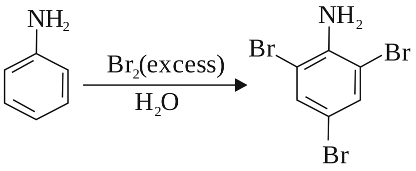


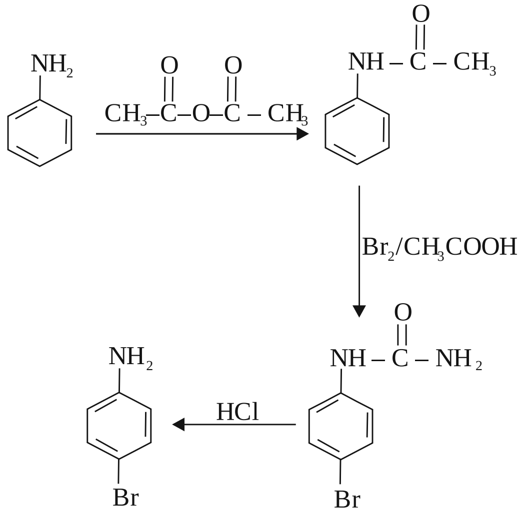
Q. 13 (3)



$$\underset{\text{Base}}{HNO_3} + \underset{\text{Acid}}{H_2SO_4} \rightarrow NO_2^+$$

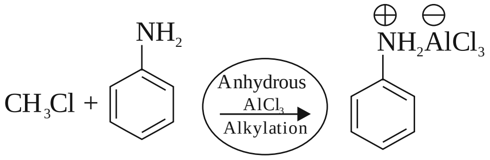
Q.14 (3)





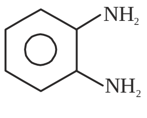
Option (3) is correct.

Q.15 (4)

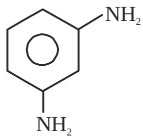


Q.16 (4)

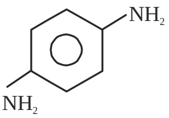
M. P. 142°C



(A)



(B)



(C)

MP = 142°C

Q.17 (3)

All these enamines are interconvertable through their resonating structures.

So most stable form is 'C' due to steric factor.

Q.18 (1)

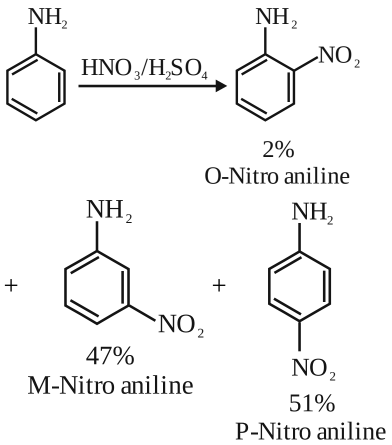
$\underset{\text{Propan - 1 - ol}}{C-C-C-OH} \rightarrow \underset{\text{n - butyl amine}}{C-C-C-NH_2}$

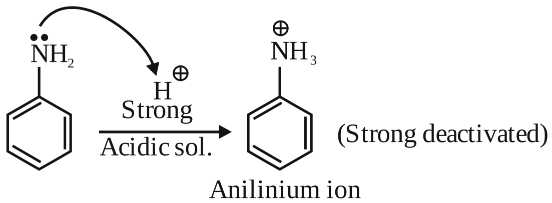
$C-C-C-OH \xrightarrow{SOCl_2} C-C-C-Cl \xrightarrow{KCN} C-C-C-CN$

$\downarrow H_2 / Ni,\ Na(Hg) / C_2H_5-OH$

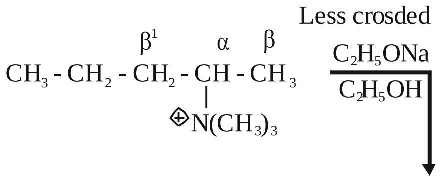
$C-C-C-C-NH_2$

Q.19 (1)





Q.20 (3)



$$CH_3-CH_2-\overset{\beta^1}{CH_2}-\underset{\oplus N(CH_3)_3}{\overset{\alpha}{CH}}-\overset{\beta}{CH_3}\xrightarrow[C_2H_5OH]{\text{Less crosded}\; C_2H_5ONa}$$

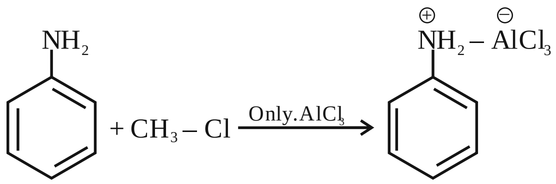
CH_3-CH_2-CH_2-CH=CH_2+

(A) Hoffmann product (major)

CH_3-CH_2-CH=$CH-CH_3$

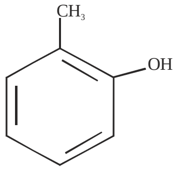
(B) (Minor)

Q.21 (3)



AROMATIC COMPOUNDS

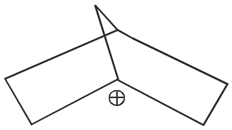
Q.22 (3)



–OH group is a strong activating group with respect to CH_3 group.

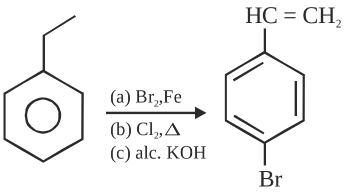
–OH group is a ortho & pera directing group.

Q.23 (3)

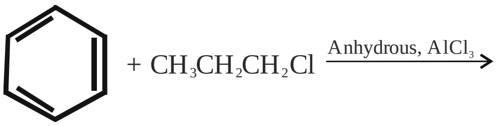


Highly unstable carbocation. Thus carbocation does not form.

Q.24 (4)



Q.25 (3)



Mech: $CH_3CH_2CH_2Cl + \text{Anhy } AlCl_3$

$$\downarrow$$

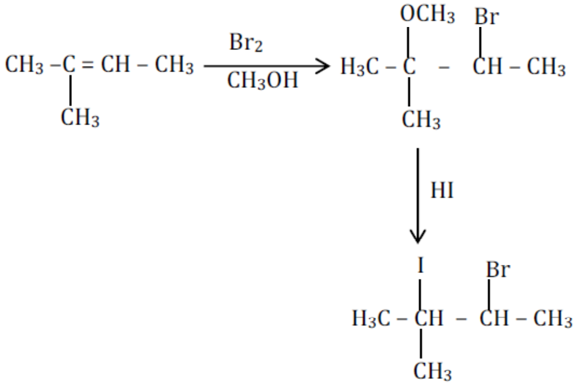
$$CH_3CH_2CH_2^{\oplus} + AlCl_4^{\Theta}$$

$$1^oC^{\oplus}$$

$$\downarrow$$

$$CH_3-\overset{\oplus}{C}H-CH_2\ 2^oC^{\oplus}\text{ more stable}$$

Q.26 (2)



Biomolecules

EXERCISE-I (MHT CET LEVEL)

Q.1 (2)

$$(C_6H_{10}O_5)_n + nH_2O \xrightarrow{H+} \underset{D-Glucose}{nC_6H_{12}O_6}$$

Q.2 (3)
Ketoses on rediction produce a new chiral carbon leading to the formation of two isomeric alcohols which are diastereomeric as wwll as C–2 epimer.

Q.3 (4)
Reaction of D-(+)-glucose with methanolic –HCl leads to formation of methyl glucoside (C_1–OH group is methylated) which, being acetal, is not hydrolysable by base, so it will not respond Tollens reagent.

Q.4 (4)
Glycosidic linkage is a type of covalent bond that joins either two carbohydrate (sugar) molecule or one carbohydrate to another group. All molecules show such type of linkages.

Q.5 (4)
Q.6 (1)
Q.7 (2)
Q.8 **(1)**
Q.9 **(1)**
Q.10 **(4)**
Q.11 **(4)**
Q.12 **(4)**
Q.13 **(2)**
Q.14 (3)
Fibrous proteins hhave thread like molecules which lie side by side to form fibres. The variaous molecules are held together by hydrogen bonds.

Q.15 (2)
Insulin is a biochemically active peptide harmone secreted by pancreas.

Q.16 (1)
Thyroxine is an amine hormone.

Q.17 (2)
If 30 percent of DNA is adenine, then by Chargaft's rule 30 percent will be thymin. The remaining 40 percent of the DNA is cytosine and guanine. Since the ratio of cytosine to guanine must be equal, then each accounts for 20 percent of the bases.

Q.18 (4)
Q.19 (2)
Q.20 (1)
Q.21 (4)
Q.22 (2)
Q.23 **(3)**
Q.24 **(2)**
Q.25 (2)
Vitamin B_{12} does not occur in plants.

Q.26 **(1)**
Q.27 **(4)**
Q.28 **(2)**
Q.29 **(1)**

Q.30 **(3)**

EXERCISE-II (NEET LEVEL)

Q.1 (2)
Amylopectin is not soluble in water.

Q.2 (2)
Invert sugar has a molecule of glucose and molecule of fructose hence glucose and fructose are in equimolar ratio.

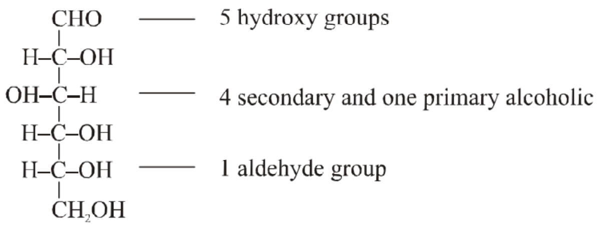
Q.3 (1)
Reducing sugars are one which reduces the Fehling's solution, Tollen's reagent and Benedict's solution

Q.4 (4)
All the monosaccharides units, maltose, lactose and reducing sugar But all the polysaccharides are non reducing sugars

Q.5 (2)
Hydrolysis of sucrose brings about a change in sign of rotation from dextro(+) to laevo(–) and such a sign change is known as inversion of sugar.

Q.6 (2)
(2) Fructose has three chiral centres and hence 23 = 8 optical isomers are possible.

Q.7 (4)



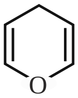
Q.8 (1)
Hydrolysis of sucrose produces a mixture which is laevorotatory

Q.9 (4)

Q.10 (1)
Anomers of glucose are differ in the stereo-chemistry at C – (1) carbon

Q.11 (4)
Sucrose is disaccharide unit

Q.12 (1)
Six membered cyclic structure of glucose is known as

pyranose because it contains ring like Pyran 

Q.13 (4)

Q.14 (1)
Maltose is made up of 2 glucose molecules.

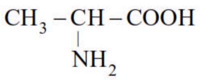
Q.15 (4)
Starch, cellulose and glycogen is polysaccharide

Q.16 (3)
Glucose + Benedict's solution → Red colour (Cu_2O).

Q.17 (3)
. Peptides are amides because it contains amide bond

Q.18 (2)
Insulin is a protein consists of 51 amino acids in two chains. α and β
α - 21 amino acids, β - 30 amino acids
It is secreted by pancreas for controlling the sugar level in blood.

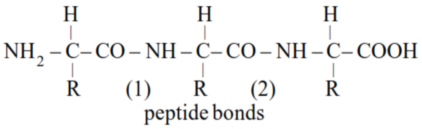
Q.19 (3)



$$CH_3-\underset{\displaystyle NH_2}{\underset{|}{CH}}-COOH$$

alanine (α amino propionic acid)

Q.20 (2)



$$NH_2-\underset{\displaystyle R}{\overset{\displaystyle H}{C}}-\underbrace{CO-NH}_{(1)}-\underset{\displaystyle R}{\overset{\displaystyle H}{C}}-\underbrace{CO-NH}_{(2)}-\underset{\displaystyle R}{\overset{\displaystyle H}{C}}-COOH$$

peptide bonds

(2) peptide bonds are required for a tripeptide

Q.21 (1)
In β-sheet of proteins, conformers are held together by intermolecular H-bond in secondary structure of protein.

Q.22 (4)
Protein molecular shape fibroins exists in silk, collagen, α-keratins.

Q.23 (2)

Q.24 (1)
Leucine is an essential amino acid

Q.25 (3)
Chlorophyll contains magnessium

Q.26 (4)

$$\underbrace{\text{Nitrogenbase} + \text{Sugar}}_{\text{Nucleoside}} + \text{Phosphate}$$

Q.27 (3)
CO (III) Transition metal is present in vitamin B_{12}.

Q.28 (1)
Enzymes are proteins

Q.29 (4)

Q.30 (2)
Insulin is known as hypoglycemic factor because it decreases glucose concentration in blood

Q.31 (2)
Benzidine is not an amino acid

Q.32 (4)
Base-Sugar-Phosphate
this is the sequence of nucleic acid

Q.33 (1)

Q.50 (4)
Vitamin-C is ascorbic acid and called antioxidant, antiscurvy vitamin

Q.35 (4)
RNA and DNA sugar differentiates at 2nd carbon atom

Q.36 (1)
A – T
G – C

Q.37 (4)
Zinc ions hold six insulin molecule to make it as hexamer

Q.38 (2)
Q.39 (2)

Q.40 (2)
RNA contains ribose sugar and uracil

EXERCISE-III (JEE MAIN LEVEL)

Q.1 (3)

Q.2 (1)

Q.3 (1)

Q.4 (3)

Q.5 (1)

Q.6 (1)

Q.7 (4)
The dipeptide is made of two amino acids they are alanine and glycine hence the name of dipeptide is alanylglycine. Hence

Q.8 (3)
The force of attraction between the neighbouring peptide chains is hydrogen bonding.

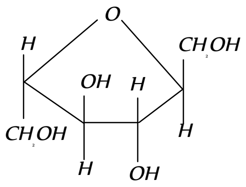
Q.9 (4)
Q.10 (4)
Q.11 (3)
Q.12 (2)
Q.13 (1)
Q.14 (1)
Q.15 (4)
Q.16 (4)
Q.17 (3)
Q.18 (2)
Q.19 (3)
Q.20 (2)
Q.21 (2)
Q.22 (4)
Q.23 (4)
Q.24 (4)
Q.25 (2)
Q.26 (3)
Q.27 (2)
Q.28 (1)
Q.29 (4)
Q.30 (1)

EXERCISE-IV

Q.1 **(9)**

Sol. No. of chiral centres in glucopyranose & fructofuranose are 5 & 4 respectively. $(p \& q)$ $p+q=9$

Q.2 5

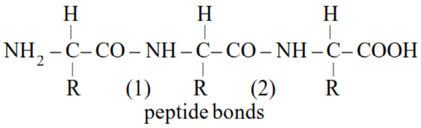


5 atoms in the ring

D-fructose

Q.3 8
(2) Fructose has three chiral centres and hence 23 = 8 optical isomers are possible.

Q.4 2

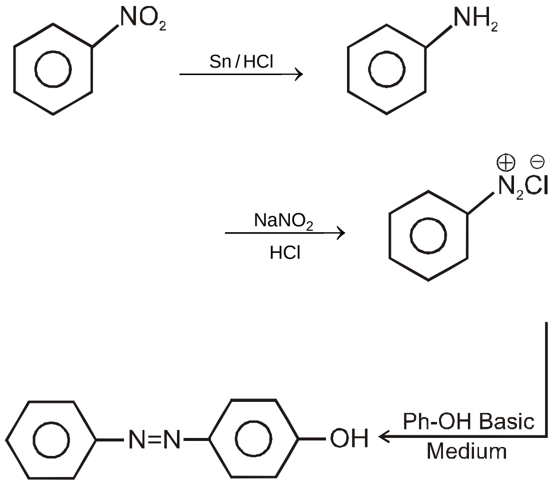


$$NH_2-\underset{R}{\overset{H}{C}}-CO-NH-\underset{R}{\overset{H}{C}}-CO-NH-\underset{R}{\overset{H}{C}}-COOH$$

(2) peptide bonds are required for atripeptide

Q.5 8

Q.6 99



molecular weight = 198

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

Q.7 **3 (1, 4, 9)**
Three products can be formed namely 1,4,9 In Hoffmann bromamide reaction there is intramolecular migration of alkyl or aryl groups so cross products are not formed.

Q.8 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.9 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.10 3
Molecular weight of octapeptide is 516 g/mole.
Total bonds to be hydrolysed (8 – 1) = 7.
Total weight of H_2O 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.

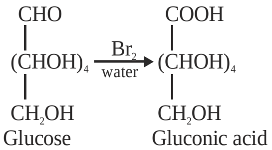
Q.11 (4) **Q.12** (3) **Q.13** (3) **Q.14** (2) **Q.15** (4)
Q.16 (4)

PREVIOUS YEAR'S

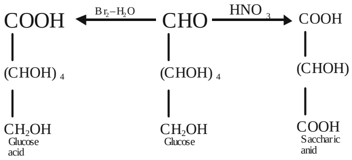
MHT CET

Q.1	(4)
Q.2	(2)
Q.3	(3)
Q.4	(3)
Q.5	(3)
Q.6	(1)
Q.7	(4)
Q.8	(4)
Q.9	(3)
Q.10	(2)
Q.11	(3)
Q.12	(3)
Q.13	(2)
Q.14	(1)
Q.15	(3)
Q.16	(2)
Q.17	(2)
Q.18	(3)
Q.19	(3)
Q.20	(1)
Q.21	(3)
Q.22	(4)
Q.23	(3)
Q.24	(3)
Q.25	(1)
Q.26	(2)
Q.27	(2)
Q.28	(4)
Q.29	(1)
Q.30	(1)
Q.31	(2)
Q.32	(3)
Q.33	(2)
Q.34	(3)
Q.35	(1)
Q.36	(4)
Q.37	(4)
Q.38	(2)

Glucose gets oxidised to six carbon carboxylic acid (gluconic acid) on reaction with a mild oxidising agent like bromine water this indicates that the carbony group is present as an aldehyde group.



Q.39 (2)



Q.40 (4)

Q.41 (2)

Q.42 (4)

Q.43 (1)

NEET/AIPMT

Q.1 (3)

Amylose and Amylopectin are polymers of α- D-glucose, so β-link is not possible. Amylose is linear with 1 → 4 α-linkage whereas Amylopectin is branched and has both 1 → 4 and 1 → 6 α-linkages.
So option (3) should be the correct option.

Q.2 (2)
It is fact

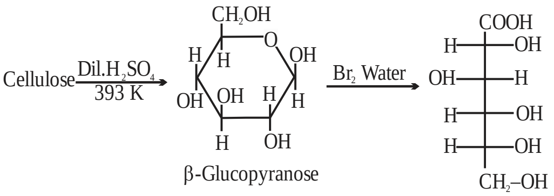
Q.3 (3)
Non esssential amino acid

Q.4 (2)
Q.5 (4)
Q.6 (2)
Q.7 (3)
Q.8 (4)
Q.9 (2)

Which is incorrect statement regarding enzymes
(1) Like chemical catalysts enzymes reduce the activation energy of bio process ⇒ This is correct statement.
(2) Enzymes are polysaccharides ⇒ This is incorrect statement because enzymes are protein in nature
(3) Enzymes are very specific for a particular reaction and substrate ⇒ This is correct statement.
(4) Enzymes are biocatalyst ⇒ This is correct statement.

JEE MAIN

Q.1 (2)



Q.2 [4]
ala–gly–leu–ala–val
4 peptide bonds

Q.3 (9)

Q.4 (4)
Fact

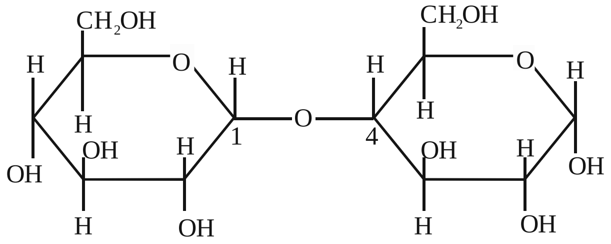
Q. 5 (3)

Ivertase : Cane sugar ⟶ Glucose and fructose
Zymase : Glucose ⟶ Ethanol and CO_2
Diastase : Starch ⟶ Maltose
Maltase : Maltose ⟶ Glucose

Q.6 (1)

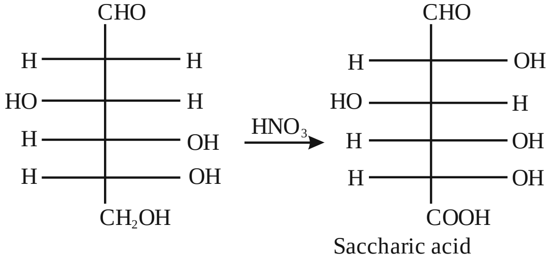
Q.7 (3)

Maltose is corporal of two α–D-glucose unit in which C-1 of one glucose is to C-4 of another glucose.



Q. 8 (2)

$$\underset{[\alpha]=66.6}{C_{12}H_{22}O_{11}} \xrightarrow{H^+} \underset{\substack{\text{D–Glucose} \\ [\alpha]=+52.7^\circ \\ \text{(A)}}}{C_6H_{12}O_6} + \underset{\substack{\text{D–Fructose} \\ [\alpha]=-92.2^\circ \\ \text{(B)}}}{C_6H_{12}O_6}$$



Q.9 (1)

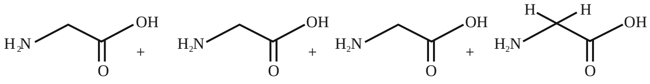
$$C_6H_{12}O_6 \xrightarrow{\text{zymase}} CH_3CH_2OH + CO_2$$

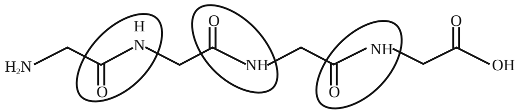
$$\xrightarrow{\text{NaOl}} H–\overset{\overset{O}{||}}{C}–O^- \, Na^+ + CHI_3$$

B is $H–\overset{\overset{O}{||}}{C}–O^-$ and we can see that number of C is 1.
So answer is 1.

Q.10 (3)
Primary structure of protein is unaffected by physical or chemical change i.e., heating.

Q.11 (2)
Q.12 (2)
Q.13 (1)
Q.14 (1)

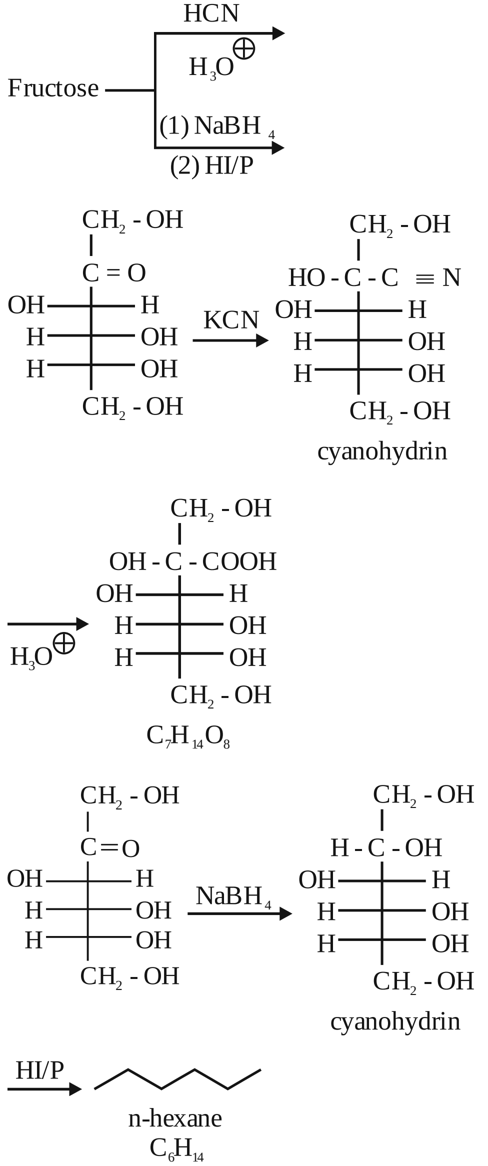




peptide bond peptide bond peptide bond

(No. of amino acid) – (peptide bond)
4 –
3
⇒ 1

Q.15 (1)



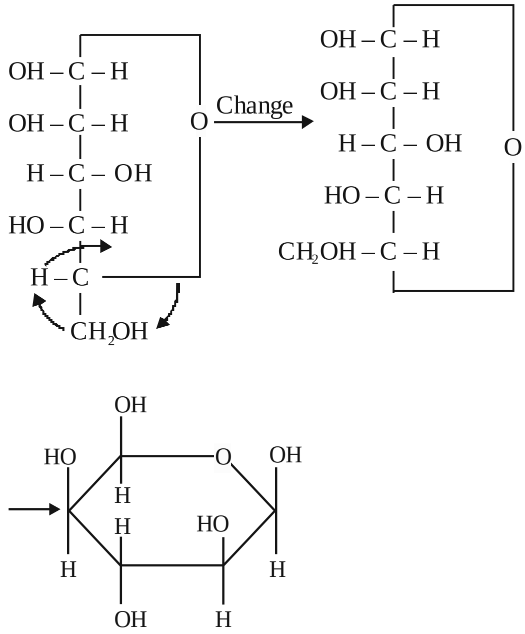
Q.16 (4)

Asseration A : Amylose is insoluble in water.

Reason R : Amylose is a long linear molecular.

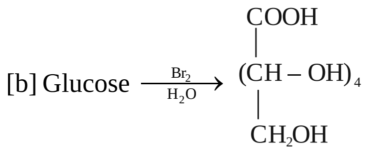
A is not correct but R is correct. Amylose is soluble in water, and amylose is long linear molecule with more than 200 glucose.

Q.17 (4)



Q.18 (1)

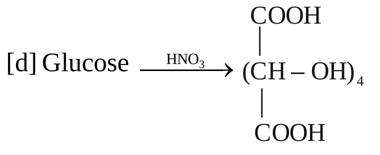
[a] Glucose $\xrightarrow{HI}$ n- hexane



[b] Glucose $\xrightarrow[H_2O]{Br_2}$ $\begin{array}{c} COOH \\ | \\ (CH-OH)_4 \\ | \\ CH_2OH \end{array}$

Gluconic acid

[c] Glucose $\xrightarrow{\text{5 acetic anhydride}}$ Glu cos e pentacetate

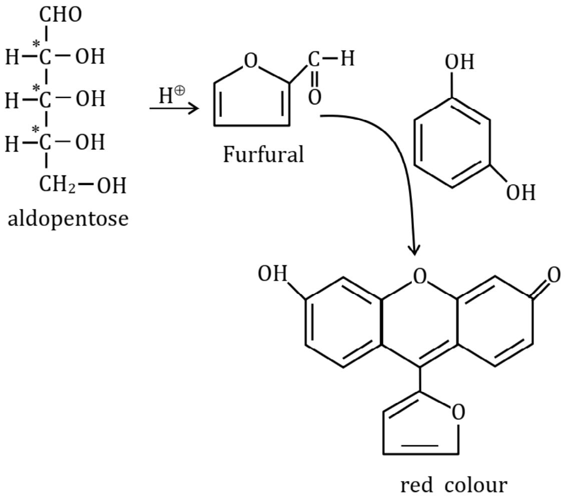


[d] Glucose $\xrightarrow{HNO_3}$ $\begin{array}{c} COOH \\ | \\ (CH-OH)_4 \\ | \\ COOH \end{array}$

Saccharic acid

Q.19 (3)
Glycogen

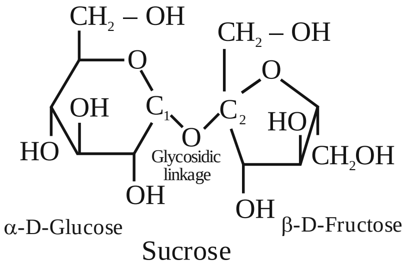
Q.20 (1)



Q.21 (1)

In which –OH group is present on anomeric carbon act as a reducing sugar

Q.22 (2)



Polymers

EXERCISE-I (MHT CET LEVEL)

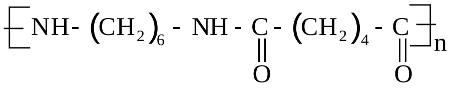
Q.1 (1)
Plexiglass is poly methyl methacrylate (PMMA) it is a homo polymer of methyl methacylate

Q.2 (3)
Bakelite is thermosetting polymer. It becomes infusible on heating and can not be remoulded

Q.3 (3)
DDT is not a polymer
DDT → dichloro diphenyl trichloro ethane

Q.4 (4)
Silk is protein fibre. Dacron is polyester fibre and Nylon-66 is polyamide fibre.

Q.5 (2)
Nylon-6, 6



$$\left[NH-(CH_2)_6-NH-\underset{\underset{O}{\|}}{C}-(CH_2)_4-\underset{\underset{O}{\|}}{C} \right]_n$$

Q.6 (2)

Q.7 **(1)**

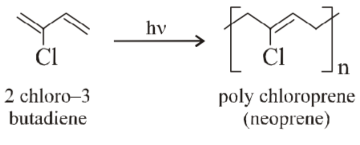
Q.8 **(2)**

Q.9 (3)
melamine is 2,4,6-triamino -1,3,5-triazine

Q.10 (2)
Perlon is Nylon-6

Q.11 (2)
Terelene is made up of terepthallic acid and ethylene glycol.

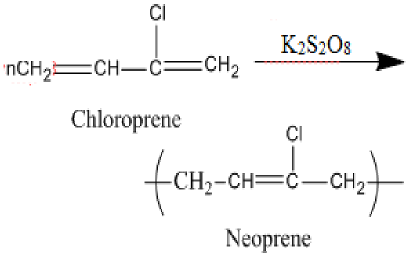
Q.12 (3)



Q.13 (3)

Q.14 (3)
Q.15 **(4)**
Q.16 **(3)**
Q.17 **(2)**
Q.18 **(2)**
Q.19 **(2)**
Q.20 **(2)**

Q.21 (4)



Q.22 (1)
Lexan used in bullet proof glass

Q.23 (1)
Chloroprene is used in making synthetic rubber.

Q.24 (2)
'Rayon' is man-made fibre which consists of purified cellulose in the form of long threads. Rayon resembles silk in appearance. Hence called as artificial silk.

$$\underset{\text{(from woodpulp)}}{\text{Cellulose}} \xrightarrow[CS_2]{NaOH} \underset{\text{(Syrup like liquid)}}{\text{Viscose}} \xrightarrow[\text{Spinneret into dil.}H_2SO_4]{\text{Pass through}} \underset{\text{(Fine silken thread)}}{\text{Rayon}}$$

EXERCISE-II (NEET LEVEL)

Q.1 (2)
Nylon-66 is manufactured by the condensation polymerization of adipic acid and hexamethylenediamine with the lose of H_2O as steam.

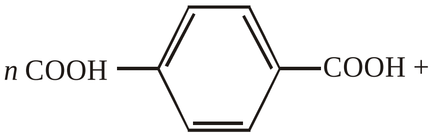
Q.2 (4)
Amylose is a linear polymer of $\alpha-D-$ Glucose

$$\underset{(C_1-C_4\ \alpha-\text{linkage})}{(-\text{Glucose}-\text{Glucose}-\text{Glucose}-)_n}$$

Q.3 (3)
Natural rubber is the only addition polymer of nature and is known as $Cis-1,4-$ polyisoprene.

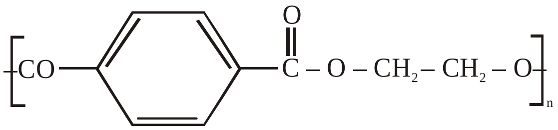
Q.4 (3)
Resins are amorphous organic solids or semisolids which usually have a typical lustre and are often transparent or translucent.

Q.5 **(1)**
Except dacron all are additive polymers.
Terephthalic acid condenses with ethylene glycol to give dacron.



Terephthalic acid

$$n\,\underset{\text{Ethylene glycol}}{HO-CH_2-CH_2-OH} \rightarrow$$



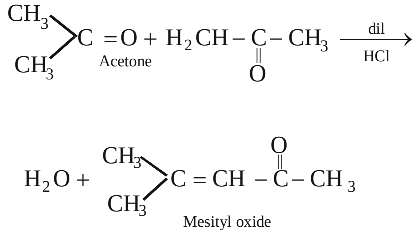
Dacron (polyester)

Q.6 **(3)**

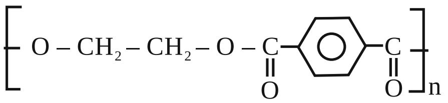
Q.7 **(1)**

Q.8 (3)
Polymers formed by condensation process with elimination of small molecule like H_2O, CO_2 etc. are known as condensation polymers.

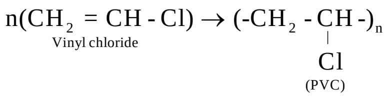
e.g.



Q.9 (3)
Terylene



Q.10 (2)



$$n(\underset{\text{Vinyl chloride}}{CH_2 = CH\text{-}Cl}) \rightarrow \underset{\text{(PVC)}}{(\text{-}CH_2\text{-}\underset{\underset{Cl}{|}}{CH}\text{-})_n}$$

Q.11 (4)
Bakelite is a thermoseting plastic

Q.12 (2)
Nylon 6 is a polyamide polymer made of caprolactam.

Q.13 (1)
Natural silk is a protein (polypeptide)

Q.14 (2)
Perspex is a synthesized polymer.

Q.15 (1)
Caprolactam in a monomer of nylon 6 (poly caprolactam)

Q.16 (4)
They have linear molecules interlinked with forces like hydrogen bonding.

Q.17 2
In vulcanisation of rubber, sulphur cross-links are introduced to improve quality and hardness of rubber.

Q.18 **(2)**

Q.19 **(3)**

Q.20 **(3)**
Q.21 **(4)**

Q.22 (2)
Condensation Polymerization because loss of water molecule takes place.

Q.23 (2)
Polystyrene and polyethylene belong to the category of thermoplastic polymers which are capable of repeatedly softening on heating and harden on cooling.

EXERCISE-III (JEE MAIN LEVEL)

Q.1 (2)

Q.2 (4)

Q.3 (2)

Q.4 (1)
Starch is polymer of α - D - glucose.

Q.5 (3)
The monomer of Nylon - 66 are adipic acid and hexamethylene diamine.

Q.6 (1)
Nylon - 66 has amide linkage.

Q.7 (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.8 (3)

Q.9 (3)

Q.10 (3)

Q.11 (1)

Q.12 (3)

Q.13 (1)
(1) → d ; B → c; C → b; D → a

Q.14 (3)
Ziegler Natta Catalyst is $Al_2(C_2H_5)_6 + TiCI_4$

Q.15 (2)

EXERCISE-IV

Q.1 (5)
Nylon - 66 Dacron, Glypolymers, PHBV and Perlon-U all are condensation copolymers.

Q.2 4
Condensation polymer = Nylon-6,6, Nylon6,10,Nylon-6, Polystyrene

Q.3 (2)

Q.4 (2)

Q.5 (2)

Q.6 (4)

Q.7 (1)

Q.8 (3)

PREVIOUS YEAR'S

MHT CET

Q.1 (4)

Q.2 (4)

Q.3 (2)

Q.4 (3)

Q.5 (3)

Q.6 (4)

Q.7 (3)

Q.8 (2)

Q.9 (2)

Q.10 (4)

Q.11 (1)

Q.12 (4)
Q.13 (1)

Q.14 (3)

Q.15 (1)

Q.16 (1)

Q.17 (2)
Q.18 (3)

Q.19 (4)

Q.20 (1)

Q.21 (4)

Q.22 (1)

Q.23 (4)

Q.24 (1)
Q.25 (3)

Q.26. (3)

Q.27 (1)

Q.28 (1)

Q.29 (4)

NEET / AIPMT

Q.5 (4)

Cross linked or network polymers are formed from bi-functional and tri-functional monomers and contain strong covalent bonds between various linear polymer chains, e.g. bakelite, melamine etc. Option (4) is not related to cross-linking.

So option (4) should be the correct option

Q.6 (2)

Nylon-2-Nylon-6 Biodegradable polymer (XII) Page No. 444 (NCERT) Chapter Polymer

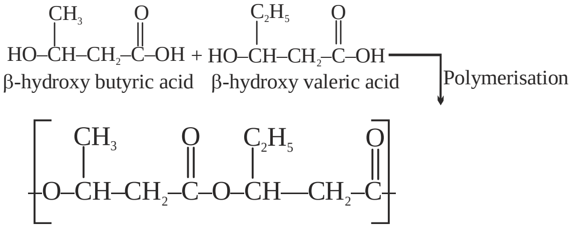
Q.7 (4)

Q.8 (3)

Thermosetting polymers are NOT reusable.

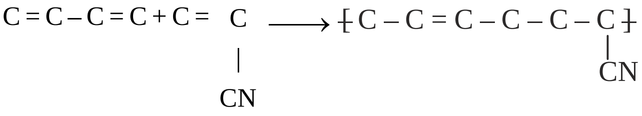
JEE MAIN

Q.1 (4)



Poly β-hydroxy butyrate–CO–β–hydroxy valerate

Q.2 (3)



$$C=C-C=C+\underset{\displaystyle CN}{\underset{|}{C}}=C \longrightarrow \left[C-C=C-C-C-\underset{\displaystyle CN}{\underset{|}{C}} \right]$$

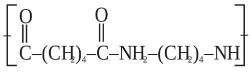
butadiene Acrylonitrile buta-N

this is addition polymer

Q.3 (A,B,C)

Buna-s: butadiene+styrene (copolymer)

Nylon-6,6: $HOOC–(CH_2)_4–COOH+H_2N–(CH_2)_6–NH_2 \rightarrow$



$$\left[\overset{O}{\overset{\|}{C}}–(CH_2)_4–\overset{O}{\overset{\|}{C}}–NH_2–(CH_2)_4–NH \right]$$

Nylon-6,6

Q.4 (1)

Q.5 (2)

hydrogen bonding provides the stability of α-helix structure of protein.

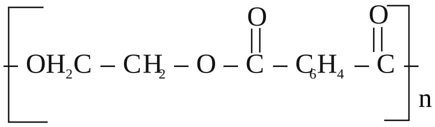
Q. 6 (2)

Buna-N is an example of elastomer.

Q.7 (1)

$n(HO-H_2C-CH_2-OH)+n\,(HOOC-C_6H_4-COOH)$

$\downarrow$



$$\left[OH_2C-CH_2-O-\overset{O}{\overset{\|}{C}}-C_6H_4-\overset{O}{\overset{\|}{C}} \right]_n$$

Dacron

Both A and R are correct and R is the correct explanation of A.

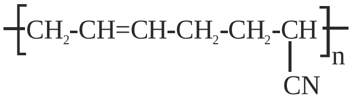
Q. 8 (3)

Natural rubber is linear polymer of isoprene (2-methyl-1, 3-butadiene) and is also called cis-1, 4-polyisoprene. The cis-polyisoprene molecules consists of various chains held together by weak Vander Wall's interactions and has a coiled structure.

Q.9 (3)

Buna-N is formula by the polymerization of butadiene & vinylcyanide

$$nCH_2=CH-CH=CH_2+nCH_2=CH-CN \xrightarrow{\text{Polymerisation}}$$



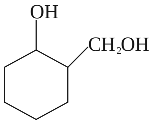
$$\left[CH_2\text{-}CH=CH\text{-}CH_2\text{-}CH_2\text{-}\underset{\displaystyle CN}{\underset{|}{CH}} \right]_n$$

It is obtained by copolymerization of 1, 3- butadiene & acrylonitrile.

Q.10 (2)

Neoprene is not a copolymer.

Q.11 (9)

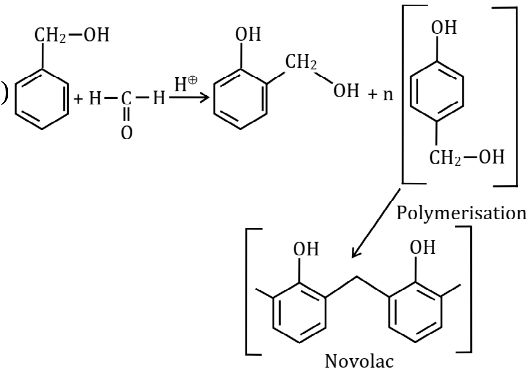


Monomer unit of novolac isits molecular mass is 124 amu.

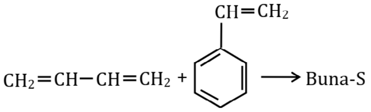
Upon considering molecular weight of polymer as 963 amu (In question its given as 963 gram) Now if during formation of Novolac, (n –1) unit of water are removed then.

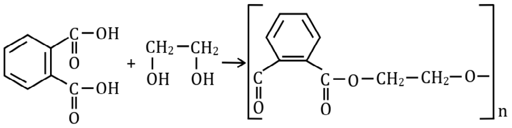
$n \times 124 = 963 + [18 \times (n-1)]$

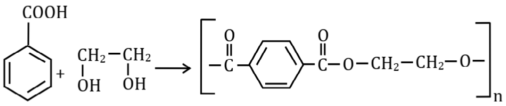
Q.12 (2)

(1) 

Novolac

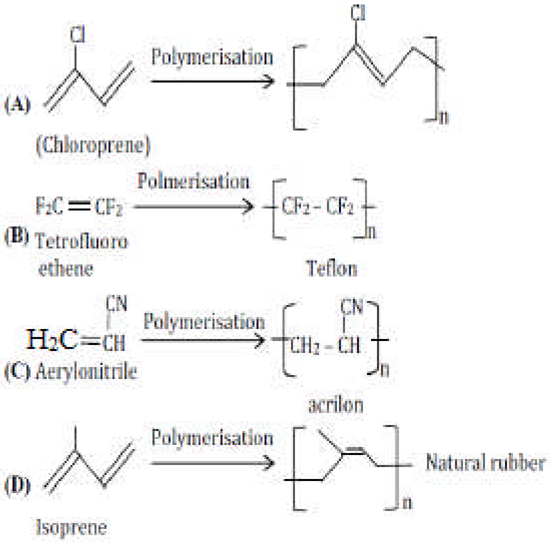
(2) 

(3) 
Glyptal

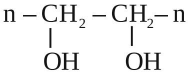
(4) 
Dacron

Q.13 (3)
Isoprene and sulphur

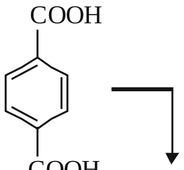
Q.14 (1)

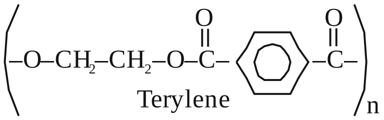


Q.15 (3)

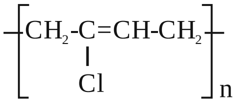

$n-\underset{OH}{CH_2}-\underset{OH}{CH_2}-n$

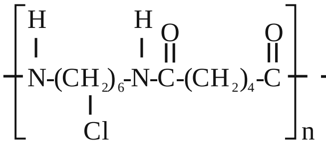
Ethylone glycol
(Ethane 1, 2-Diol)

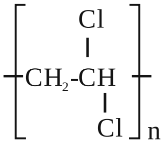

Terepthalic acid
(Benzene-1, 4-di
carboxylic acid)

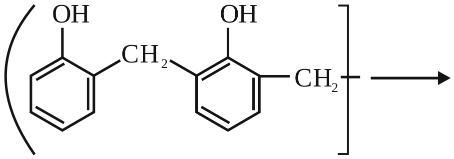

Terylene

Q.16 (2)

(1) 
$\left[-CH_2-\underset{Cl}{C}=CH-CH_2-\right]_n$ → Elastoners

(2) 
$\left[-\overset{H}{N}-(\underset{Cl}{CH_2})_6-\overset{H}{N}-\overset{O}{\overset{\|}{C}}-(CH_2)_4-\overset{O}{\overset{\|}{C}}-\right]_n$ → Fibers

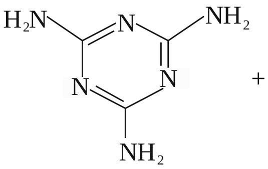
(3) 
$\left[-CH_2-\underset{Cl}{\overset{Cl}{CH}}-\right]_n$ → Thermoplastic polymer

(4) 
Thermosetting polymer

Q.17 (4)
Rayon is not a natural polymer.

Q.18 (4)
(1) Choroform + Aniline → [iii] Distillation
(2) Benzoic acid + Naphthalene → (iv) Crystallisation
(3) Wather + Anine → (i) Steam distillation
(4) Naphthalene + sodium choride → (ii) Sublimation

Q.19 (1)



+ HCHO → Melamine formalde hyderesin

Q.20 (2)
a. Nylon → Bristles of brushes
b. Low density polythene → Toys
c. High density polythene → Bucket
d. Teflon → Non-stick utensils

CHEMISTRY IN EVERYDAY LIFE

EXERCISE-I (MHT CET LEVEL)

Q.1 (2)
N – Acetyl-para - aminophenol is known as paracetamol and it is used as non-narcotic analgesic.

Q.2 (2)
Oxytocin is a hormone (nanopetide) which contracts uterus after the child birth and produces lactation in the mammary glands.

Q.3 **(1)**
Phenelzine is an anidepressant, whie others are antacids.

Q.4 (1)

Q.5. (1)

Q.6 **(1)**

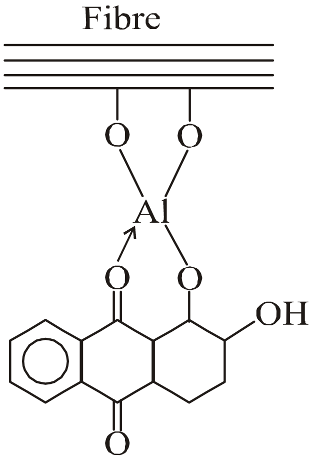
Q.7 **(3)**

Q.8 **(1)**

Q.9 **(1)**

Q.10 **(2)**

Q.11 (4)
Alizarin is an anthraqunone dye. It gives a bright red colour with aluminium and a blue colour with aluminium and a blue colour with barium.



Q.12 (4)

Q.13 (3)

Q.14 (3)

Q.15 (4)

Q.16 **(1)**

Q.17 **(2)**

Q.18 **(1)**

Q.19 **(3)**

Q.20 **(3)**

Q.21 **(3)**

Q.22 **(2)**

EXERCISE-II (NEET/JEE MAIN LEVEL)

Q.1 (3)
Chloroquine medicine is required for malaria.

Q.2 (3)
Chloroxylenol and terpinol used in detttol.

Q.3 (3)
Cocaine used as antidepressants.

Q.4 (1)

Q.5 (1)
Penicillin is an antibiotic

Q.6 (1)
Aspirin is an antipyertic and non-narcotic analgesic.

Q.7 (1)
Paracetamol used as non-narcotic analgesic.

Q.8 (2)
Veronal used as a sedative drug.

Q.9 (2)
Luminal used as Hypnotic drug

Q.10 (3)
Morphine used as narcotic analgesic

Q.11 (2)
Aspirin used as analgesic and as antipyretic

Q.12 (3)
Sulphanilamide is an antibiotic and sulpha drygs are derivatives of sulphnilamide.

Q.13 (3)
Ampicillin is a synthetic antibiotic.

Q.14 (2)
1% solution of phenol is used as Disinfectant

Q.15 (4)
Dettol, Iodoform, Bithional used as antiseptic.

Q.16 (4)
Sulphadiazine used as an antidepressant

Q.17 (4)
Barbituric acid derivatives used as sedative drug

Q.18 (3)
Tranquilizers are used for the treatment of mental diseases like depression.

Q.19 (1)
Tranquilizer used to Reduce anxiety and brings about calmness

Q.20 (2)
Dettol consist of chloroxylenol + terpeneol

Q.21 (1)
Bithinal used as antiseptic

Q.22 (2)
2- Acetoxybenzoic acid is known as aspirin, used as antipyretic as well as analgesic.

Q.23 (1)
Antipyretic drug used to bring down body temperature is fever.

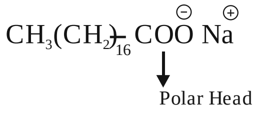
Q.24 (2)
2-Acetoxy benzoic acid is known as aspirin.

Q.25 (3)
Equanil used in Hypertension.

Q.26 (4)
Chloramphenicol used as broad spectrum antibiotic,

Q.27 (1)
Soap is sodium and potassium stearate.

Q.28 (3)



$$CH_3(CH_2)_{16}\underset{\downarrow\,\text{Polar Head}}{COO^{\ominus}}\,Na^{\oplus}$$

Q.29 (1)
Detergents reduces the surface tension of water.

Q.30 (4)
L ABS [linear Alkyl Benzene] Detergents are biodegradable

EXERCISE-III

Q.1 (3)

Q.2 (4)

Q.3 (2)

Q.4 (1)

Q.5 (4)

Q.6 (4)

PREVIOUS YEAR'S

MHT CET

Q.1 (2)

Q.2 (1)

Q.3 (2)

Q.4 (3)

Q.5 (1)

Q.6 (1)

Q.7 (2)

Q.8 (2)

Q.9 (1)

Q.10 (4)

Q.11 (2)

Q.12 (4)

Q.13 (4)

Q.14 (1)

Q.15 (4)

Q.16 (1)

Q.17 (4)

Q.18 (3)

Q.19 (1)

Q.20 (1)

Q.21 (4)

Q.22 (2)

Q.23 (2)

Q.24 (3)

Q.25 (1)

Vinegar (acetic acid) is used as household cleaner to remove stains and is also a favourite dressing on salads.

Q.26 (3)

NEET / AIPMT

Q.1 (1)

Fast Based from NCERT Page No 455 Chapter Chemistry in every day life.

(Penicillin G has narrow spectrum while Chloramphenicol, Ampicillin, Amoxycillin are broad spectrum)

Q.2 (1)

Q.3 (1)

The presence of particulate matter in pulluted air catalyes the oxidation of sulphurdioxide to sulphur trioxide.

$2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$

The reaction can also be promoted by ozone and hydrogen peroxide.

$SO_2(g) + O_3(g) \rightarrow SO_3(g) + O_2(g)$

$SO_2(g) + H_2O_2(l) \rightarrow H_2SO_4(aq)$

Q.4 (1)

Antacid – Cimetidine
Antihistamine – Seldane
Analgesis – Morphine
Antimicrobials – Salvarsan

JEE MAIN

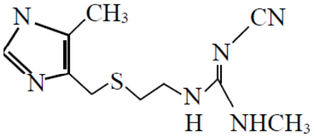
Q.1 (3)
Histamine (it is used for secretin of pepsin & HCl in stomach)

Q.2 (4)
Penicillin G is not a broad spectrum antibiotic.

Q.3 (2)

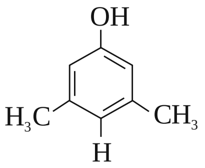
Q.4 (1)
Antipyretic : Reduce fever; Analgeric; Reducer pain
Tranquilizer : Reduce stress; Antacid ; Reduce acidity (Stomach)

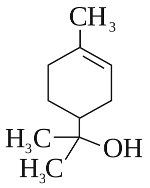
Q.5 (3)
Tegamet is the brand name of Cimetidine



Q.6 (3)
Histamine ($C_5H_9N_3$)

Q.7 (1)





Mixture chloroxylenol and terpineol is antiseptic.

Q. 8 (2)
Fact

Q.9 (3)
Q.10 (2)

Q.11 (2)
Artifical sweetner : Aspartane, sucralose, saccharin, xylitol etc.

Q.12 (2)
Amytol is hypnotic drug
Amytal is derivative of barbiturate is sedative-hypnatic drug

Q.13 (3)
Enzyme inhibitors are both competitive inhibitors as well as non-competitive inhibitors. Competitive inhibitors compete with natural substracts for attachement on active side of enzyme non-competitives inhibitors binds to allosteric site.

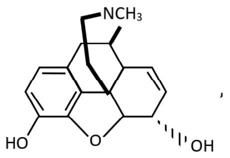
Q.14 [1]
Ofloxacin

Q.15 (4)

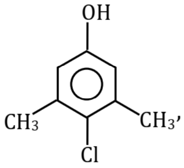
$$\underset{\text{Stearic acid}}{C_{17}H_{35}COOH} + \underset{\text{Polyethylene glycol}}{HO(CH_2CH_2O)_nCH_2CH_2OH} \xrightarrow{-H_2O} \underset{\text{Non-Ionic detergent}}{C_{17}H_{35}COO(CH_2CH_2O)_nCH_2CH_2OH}$$

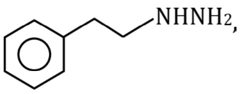
Q.16 (3)
The common components of photochemical smong are ozone, nitric oxide, acrolein, formeldehyde and PAN

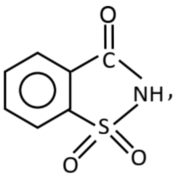
Q.17 (2)
Q.18 (2)
Q.19 (3)

(1)  ,

marphine reduce the pain, hence it is narcotic-analgesic

(2)  , chloroxylenol is used as antiseptic

(3)  , phenelize use as antidepressant

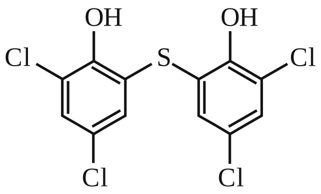
(4)  , Saccharin is 550 times sweeter than cane sugar

Q.20 (3)
Sodium rosinat enhances the lathering properties of soap sodium rosinate help to lather form.

Q.21 (4)

Drug can bond (1) active sites (2) (allosteric site) of enzyme by formation of covalant bond. Based on durg can be called (1) competitive inhibitors and (2) non-competitive inhibitors.

Q.22 (4)



Bithionol

No. of chlorine atom = 4