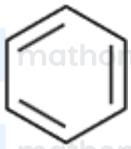
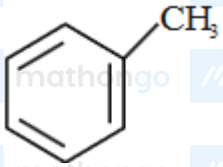
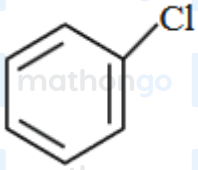
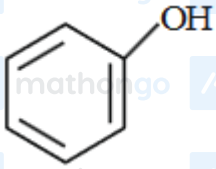
Q1 - 2024 (01 Feb Shift 1)

Which of the following compound will most easily be attacked by an electrophile?

(1) 

(2) 

(3) 

(4) 

Q2 - 2024 (01 Feb Shift 1)

Given below are two statements:

Statement (I) : The NH_2 group in Aniline is ortho and para directing and a powerful activating group.

Statement (II) : Aniline does not undergo FriedelCraft's reaction (alkylation and acylation).

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are correct

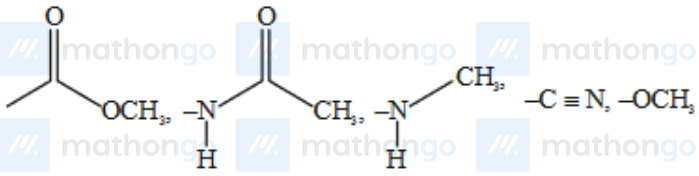
(2) Both Statement I and Statement II are incorrect

(3) Statement I is incorrect but Statement II is correct

(4) Statement I is correct but Statement II is incorrect

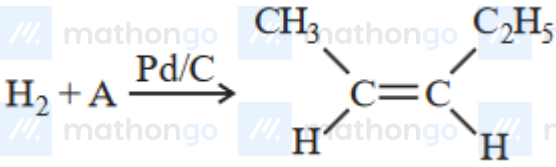
Q3 - 2024 (01 Feb Shift 1)

Total number of deactivating groups in aromatic electrophilic substitution reaction among the following is



Q4 - 2024 (01 Feb Shift 2)

In the given reactions identify A and B.



$$CH_3 - C \equiv C - CH_3 + H_2 \xrightarrow{\text{Na/ Liquid } NH_3} \text{“ B ”}$$

(1) A : 2-Pentyne; B : trans - 2 - butene

(2) A : n-Pentane; B : trans - 2 - butene

(3) A : 2 - Pentyne; B : Cis -2 - butene

(4) A : n-Pentane; B : Cis -2 - butene

Q5 - 2024 (01 Feb Shift 2)

Total number of isomeric compounds (including stereoisomers) formed by monochlorination of 2 - methylbutane is _____.

Q6 - 2024 (27 Jan Shift 1)

3-Methylhex-2-ene on reaction with HBr in presence of peroxide forms an addition product (A). The number of possible stereoisomers for ' A ' is

Q7 - 2024 (27 Jan Shift 1)

Among the following, total number of meta directing functional groups is (Integer based)

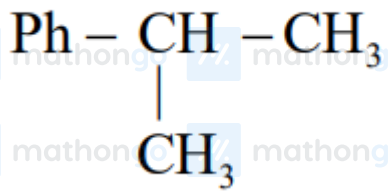
$-OCH_3, -NO_2, -CN, -CH_3 - NHCOCH_3,$
$-COR, -OH, -COOH, -Cl$

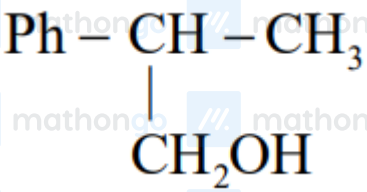
Q8 - 2024 (27 Jan Shift 2)

The final product A, formed in the following reaction sequence is:

$$Ph{-}CH{=}CH_2 \xrightarrow[\text{(ii) } H_2O_2,\ \ominus OH]{\text{(i) } BH_3} \xrightarrow[\text{(iv) Mg, ether, then } HCHO/H_3O^+]{\text{(iii) HBr}} A$$

(1) $Ph - CH_2 - CH_2 - CH_3$

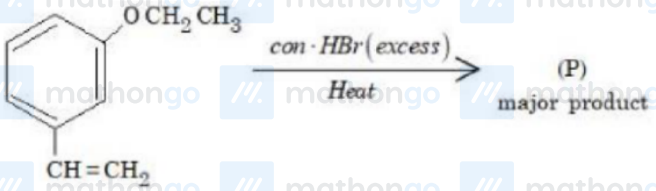
(2) 

(3) 

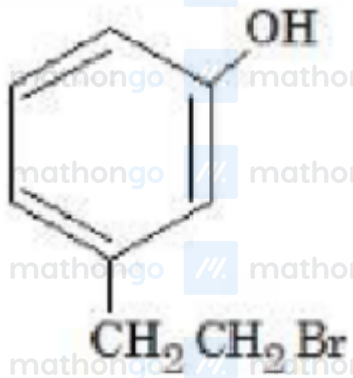
(4) $Ph - CH_2 - CH_2 - CH_2 - OH$

Q9 - 2024 (29 Jan Shift 1)

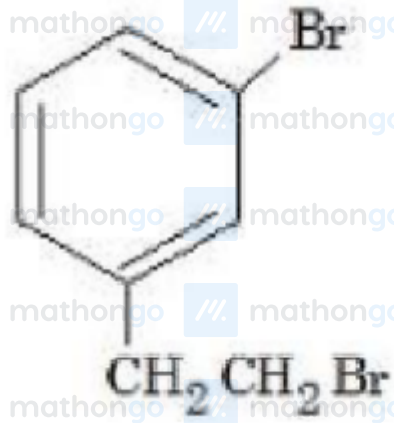
The major product (P) in the following reaction is



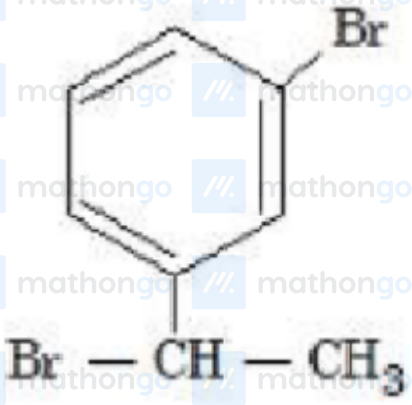
(1)

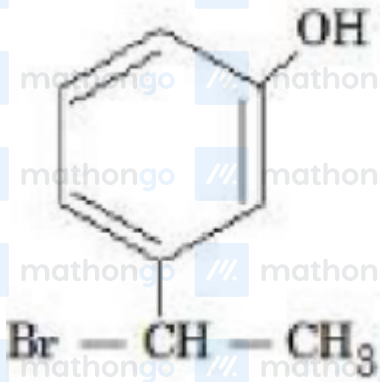


(2)



(3)

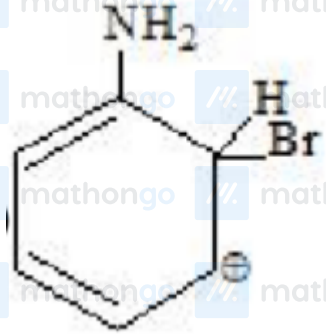




(4)

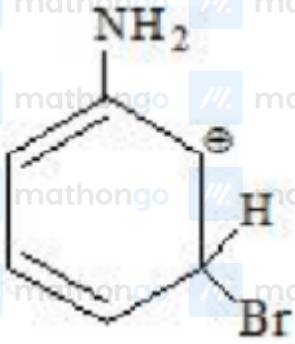
Q10 - 2024 (29 Jan Shift 1)

The arenium ion which is not involved in the bromination of Aniline is

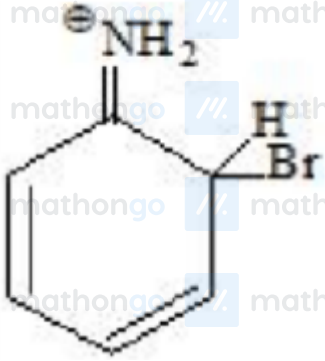


(1)

(2)



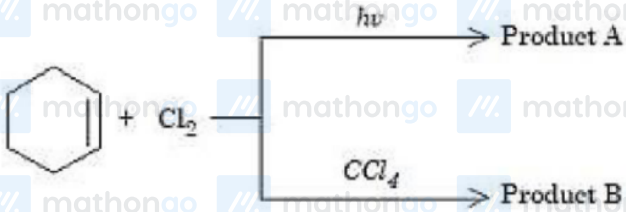
(3)

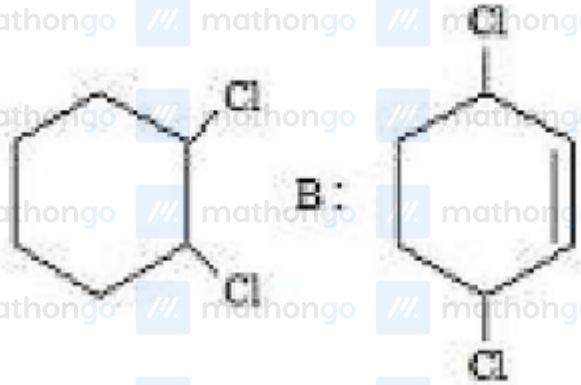


(4)

Q11 - 2024 (29 Jan Shift 1)

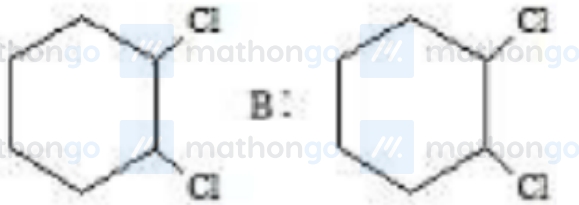
Identify product A and product B :





(1) A:

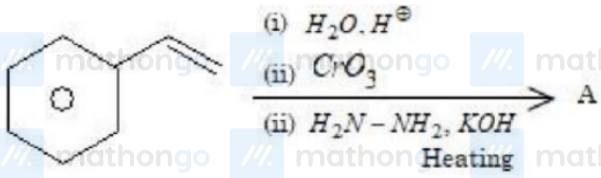
(2) A: 

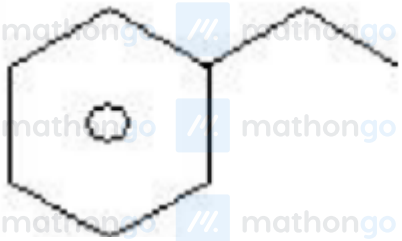
(3) A: 

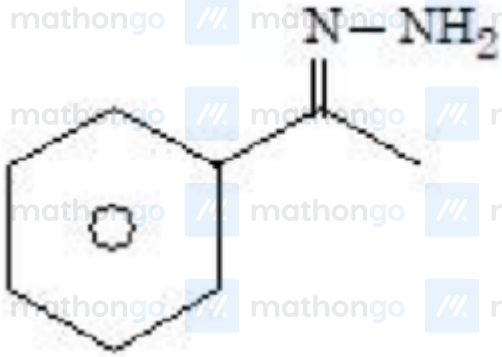
(4) A: 

Q12 - 2024 (29 Jan Shift 1)

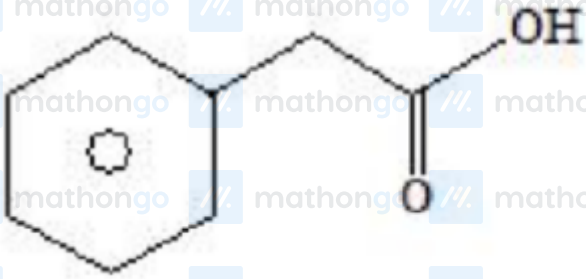
The final product A formed in the following multistep reaction sequence is



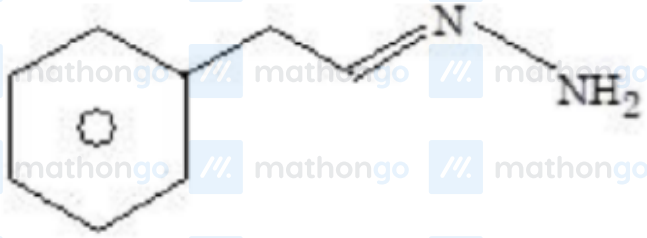
(1) 



(2)

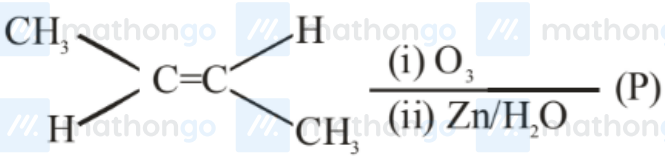


(3)



(4)

Q13 - 2024 (29 Jan Shift 1)

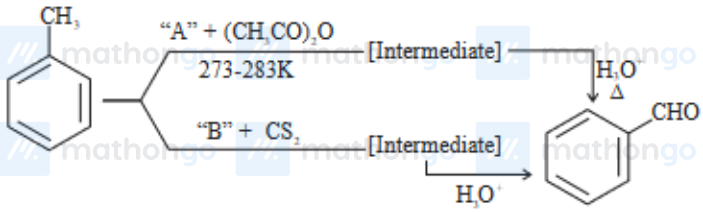


Consider the given reaction. The total number of oxygen atoms present per molecule of the product (P) is

_____

Q14 - 2024 (30 Jan Shift 1)

In the given reactions identify the reagent A and reagent B



(1) $\mathrm{A}-\mathrm{CrO}_3$

$\mathrm{B}-\mathrm{CrO}_3$

(2) $\mathrm{A}-\mathrm{CrO}_3$

$\mathrm{B}-\mathrm{CrO}_2\mathrm{Cl}_2$

(3) $\mathrm{A}-\mathrm{CrO}_2\mathrm{Cl}_2$

$\mathrm{B}-\mathrm{CrO}_2\mathrm{Cl}_2$

(4) $\mathrm{A}-\mathrm{CrO}_2\mathrm{Cl}_2$

$\mathrm{B}-\mathrm{CrO}_3$

Q15 - 2024 (30 Jan Shift 1)

Compound A formed in the following reaction reacts with B gives the product C. Find out A and B.

$$\mathrm{CH_3-C\equiv CH+Na\rightarrow A\xrightarrow{B}\underset{(C)}{CH_3-C\equiv C-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH_2}}}+NaBr}$$

(1) $\mathrm{A}=\mathrm{CH}_3-\mathrm{C}\equiv\overline{\mathrm{C}}\mathrm{Na}, \mathrm{B}=\mathrm{CH}_3-\mathrm{CH}_2-\mathrm{CH}_2-\mathrm{Br}$

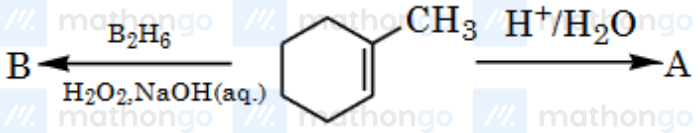
(2) $\mathrm{A}=\mathrm{CH}_3-\mathrm{CH}=\mathrm{CH}_2,\ \mathrm{B}=\mathrm{CH}_3-\mathrm{CH}_2-\mathrm{CH}_2-\mathrm{Br}$

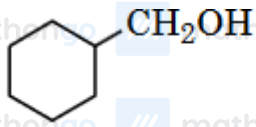
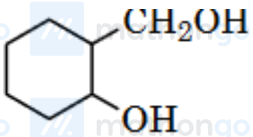
(3) $\mathrm{A}=\mathrm{CH}_3-\mathrm{CH}_2-\mathrm{CH}_3,\ \mathrm{B}=\mathrm{CH}_3-\mathrm{C}\equiv\mathrm{CH}$

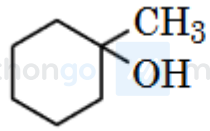
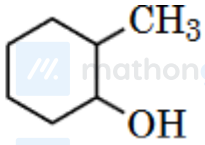
(4) $\mathrm{A}=\mathrm{CH}_3-\mathrm{C}\equiv\overline{\mathrm{C}}^{+}\mathrm{a}, \mathrm{B}=\mathrm{CH}_3-\mathrm{CH}_2-\mathrm{CH}_3$

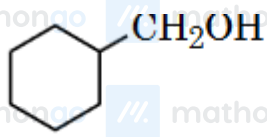
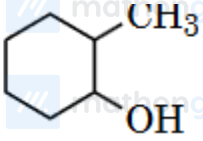
Q16 - 2024 (30 Jan Shift 2)

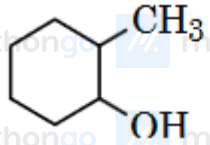
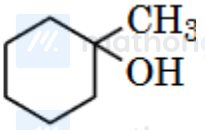
Product A and B formed in the following set of reactions are:



(1) A =  B = 

(2) A =  B = 

(3) A =  B = 

(4) A =  B = 

Q17 - 2024 (31 Jan Shift 1)

The product (C) in the below mentioned reaction is:

$$CH_3 - CH_2 - CH_2 - Br \xrightarrow[\Delta]{KOH_{(dik)}} A \xrightarrow{HBr} B \xrightarrow[KOH_{[a]}]{\Delta} C$$

(1) Propan-1-ol

(2) Propene

(3) Propyne

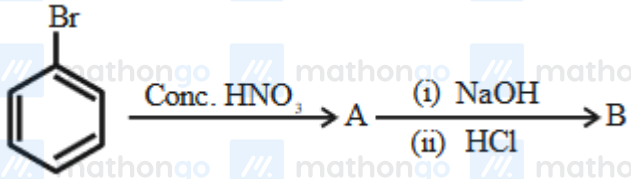
(4) Propan-2-ol

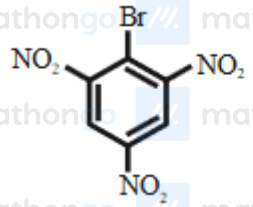
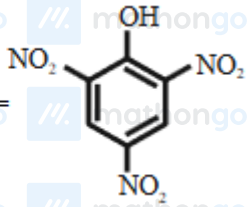
Q18 - 2024 (31 Jan Shift 1)

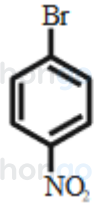
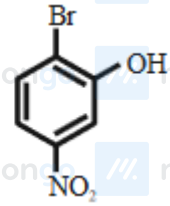
Number of alkanes obtained on electrolysis of a mixture of CH_3COONa and C_2H_5COONa is _____

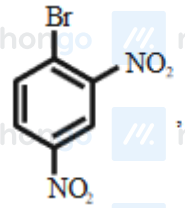
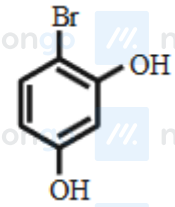
Q19 - 2024 (31 Jan Shift 2)

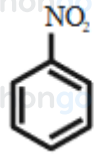
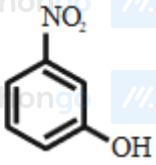
Identify A and B in the following reaction sequence.



(1) A=  , B= 

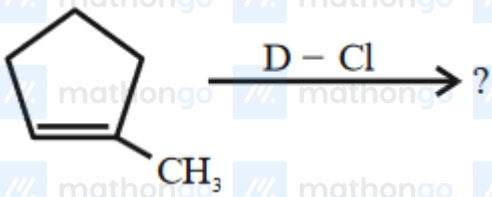
(2) A=  , B= 

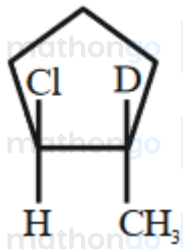
(3) A=  , B= 

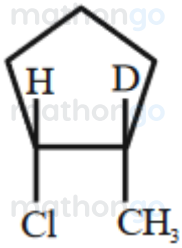
(4) A=  , B= 

Q20 - 2024 (31 Jan Shift 2)

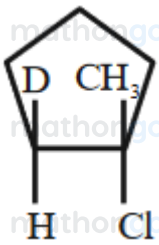
Major product of the following reaction is -



(1) 



(2)



(3)

(4) None of these

Q21 - 2024 (31 Jan Shift 2)

Number of isomeric products formed by monochlorination of 2-methylbutane in presence of sunlight is _____.

Answer Key

Q1 (4)	**Q2** (1)	**Q3** (2)	**Q4** (1)
Q5 (6)	**Q6** (4)	**Q7** (4)	**Q8** (4)
Q9 (4)	**Q10** (3)	**Q11** (4)	**Q12** (1)
Q13 (1)	**Q14** (2)	**Q15** (1)	**Q16** (2)
Q17 (4)	**Q18** (3)	**Q19** (1)	**Q20** (3)
Q21 (6)			

Q1

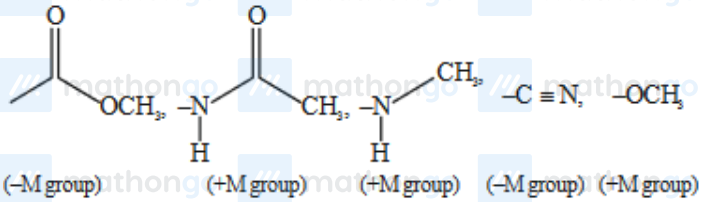
Higher the electron density in the benzene ring more easily it will be attacked by an electrophile. Phenol has the highest electron density amongst all the given compound.

Q2

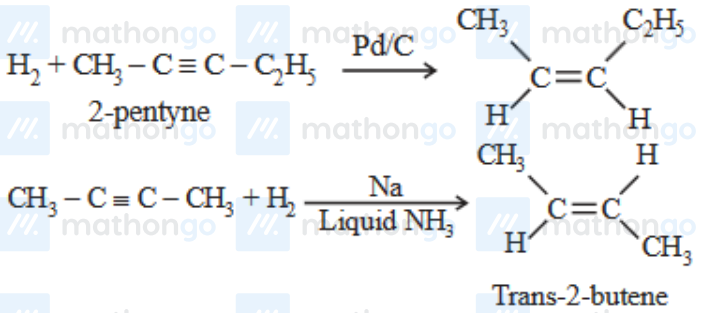
The NH_2 group in Aniline is ortho and para directing and a powerful activating group as NH_2 has strong +M effect.

Aniline does not undergo Friedel-Craft's reaction (alkylation and acylation) as Aniline will form complex with $AlCl_3$ which will deactivate the benzene ring.

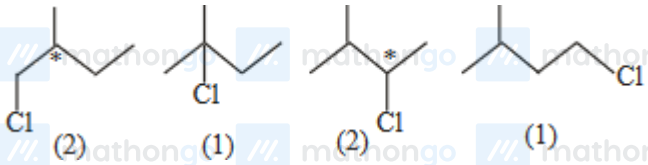
Q3



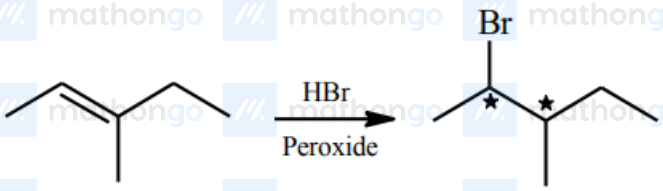
Q4



Q5



Q6



2chiral centres

No. of stereoisomers = 4

Q7

$-NO_2, -C \equiv N, -COR, -COOH$ are meta directing.

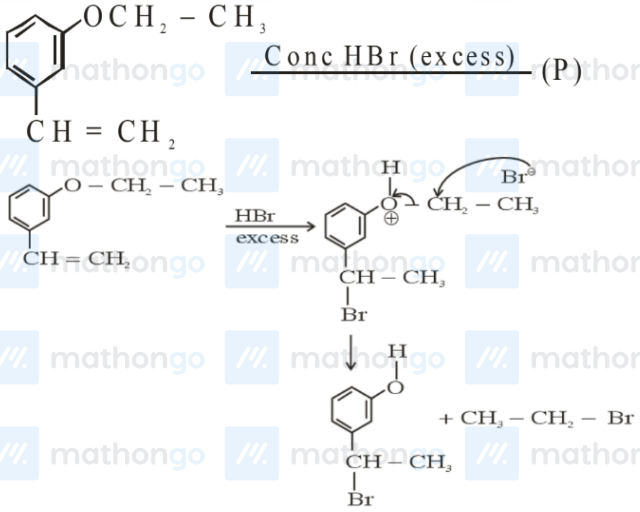
Q8

$$PhCH = CH_2 \xrightarrow{B_2H_6/H_2O_2,OH^-} PhCH_2CH_2OH$$

$$PhCH_2CH_2OH + HBr \longrightarrow PhCH_2CH_2Br + H_2O\,(SN^{NGP})$$

$$PhCH_2CH_2CH_2OH \xleftarrow[\text{(II) } H_3O^+]{\text{(I) } H-\overset{\overset{O}{\|}}{C}-H} PhCH_2CH_2MgBr \quad (\downarrow \text{Mg/dry ether})$$

Q9



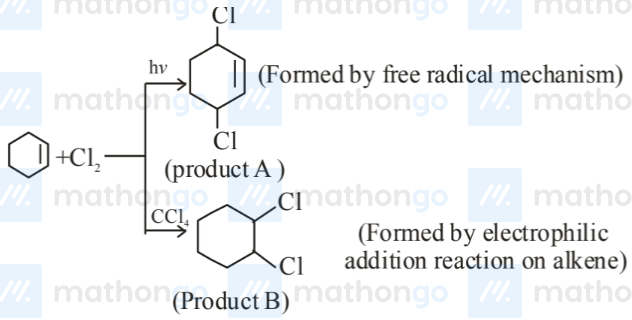
Q10

Since $-NH_2$ group is o/p directing hence arenium ion will not be formed by attack at meta position i.e.

< smiles > Nc1cccc(Br)c1 < /smiles >

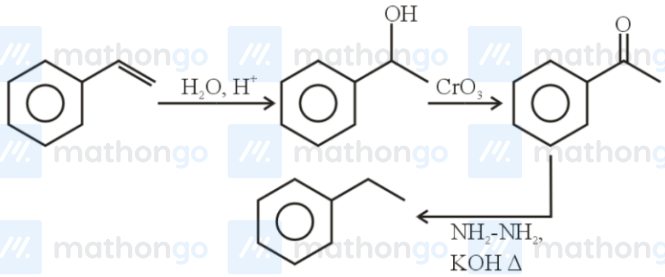
Hence Answer is (3)

Q11

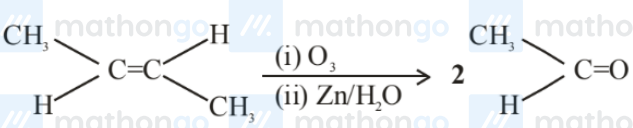


Hence correct Ans. (4)

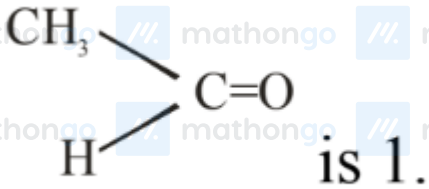
Q12



Q13

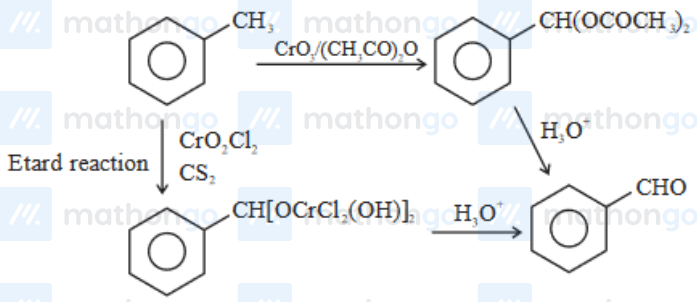


Hence total number of oxygen atom present per

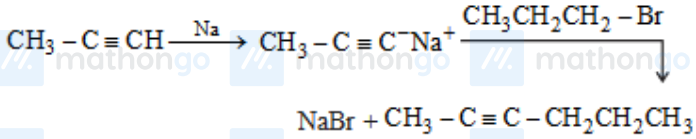


molecule

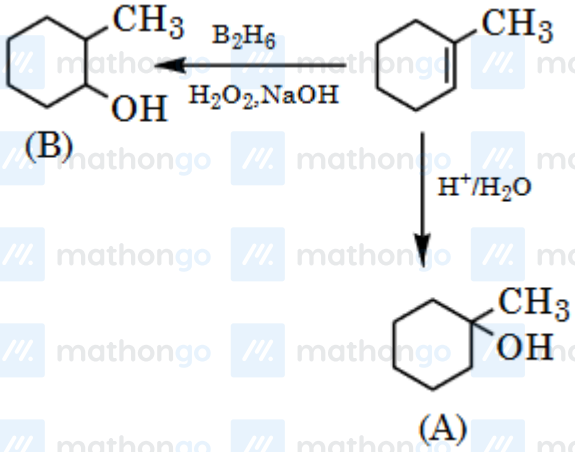
Q14



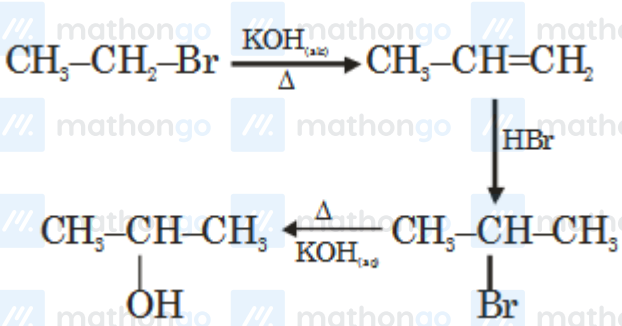
Q15



Q16



Q17



Q18

$CH_3COONa \rightarrow \dot{C}H_3$

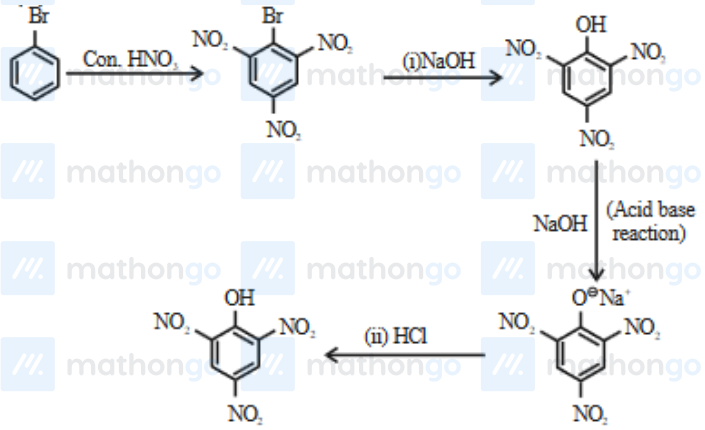
$C_2H_5COONa \rightarrow \dot{C}H_5$

$2\dot{C}_2H_5 \rightarrow CH_3 - CH_2 - CH_2 - CH_3$

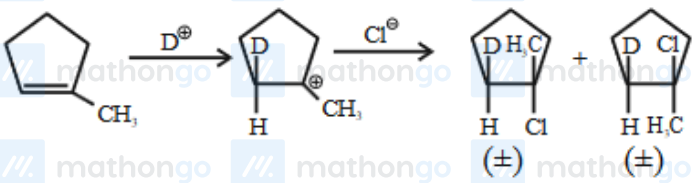
$2\dot{C}H_3 \rightarrow CH_3 - CH_3$

$\dot{C}H_3 + \dot{C}_2H_5 \rightarrow CH_3 - CH_2 - CH_3$

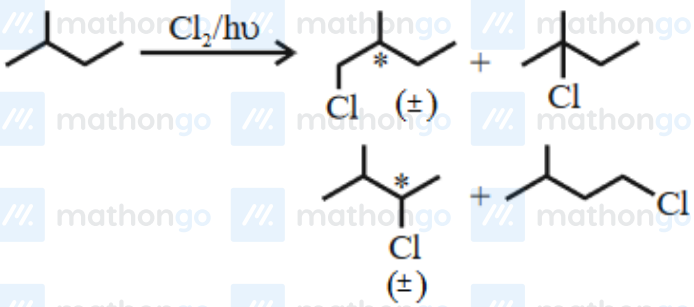
Q19



Q20



Q21



$\therefore$ Number of isomeric products = 6