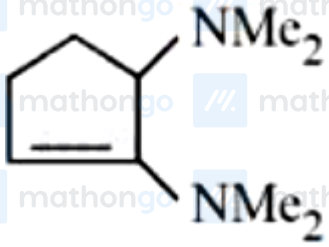
Q1 - 2024 (04 Apr Shift 1)

Xg of ethylamine is subjected to reaction with $NaNO_2/HCl$ followed by water; evolved dinitrogen gas which occupied 2.24 L volume at STP. X is $\times 10^{-1}$ g.

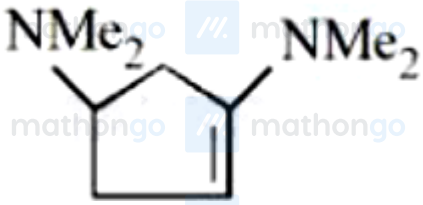
Q2 - 2024 (04 Apr Shift 2)

Find out the major product formed from the following reaction. [Me : $-CH_3$]

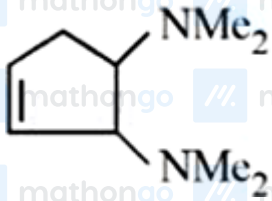
(1)



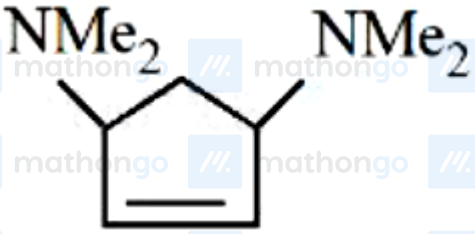
(2)



(3)

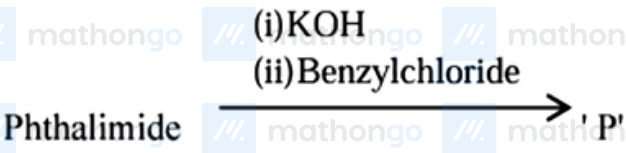


(4)



Q3 - 2024 (04 Apr Shift 2)

Phthalimide is made to undergo following sequence of reactions.



Total number of π bonds present in product 'P' is/are _____

Q4 - 2024 (04 Apr Shift 2)

From 6.55 g of aniline, the maximum amount of acetanilide that can be prepared will be _____ $\times 10^{-1}$ g.

Q5 - 2024 (05 Apr Shift 2)

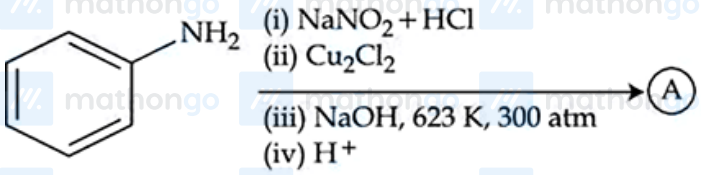
Xg of ethanamine was subjected to reaction with $NaNO_2/HCl$ followed by hydrolysis to liberate N_2 and HCl. The HCl generated was completely neutralised by 0.2 moles of NaOH. X is _____ g.

Q6 - 2024 (06 Apr Shift 1)

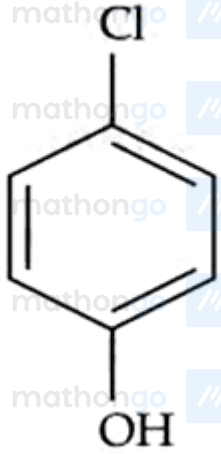
9.3 g of pure aniline upon diazotisation followed by coupling with phenol gives an orange dye. The mass of orange dye produced (assume 100\% yield/conversion) is _____ g. (nearest integer)

Q7 - 2024 (06 Apr Shift 2)

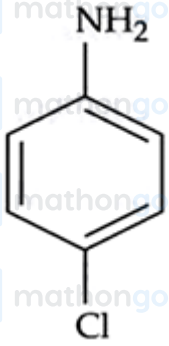
Identify the product (A) in the following reaction.



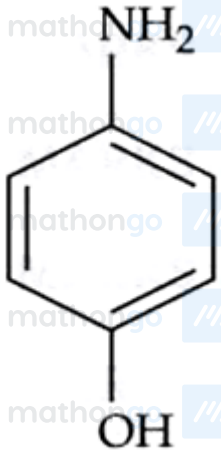
(1)



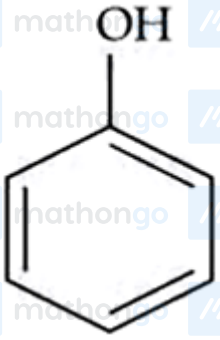
(2)



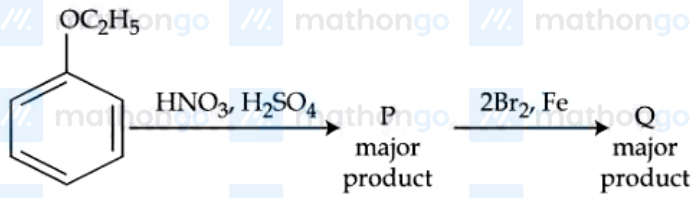
(3)



(4)



Q8 - 2024 (06 Apr Shift 2)



The ratio of number of oxygen atoms to bromine atoms in the product Q is _____ $\times 10^{-1}$.

Q9 - 2024 (06 Apr Shift 2)

An amine (X) is prepared by ammonolysis of benzyl chloride. On adding p-toluenesulphonyl chloride to it the solution remains clear. Molar mass of the amine (X) formed is _____ $gmol^{-1}$.

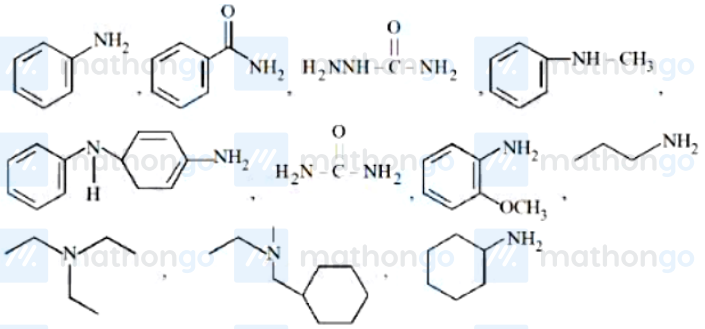
(Given molar mass in $gmol^{-1} C: 12, H: 1, O: 16, N: 14$)

Q10 - 2024 (08 Apr Shift 1)

If 279 g of aniline is reacted with one equivalent of benzenediazonium chloride, the maximum amount of aniline yellow formed will be _____ g. (nearest integer)
(consider complete conversion).

Q11 - 2024 (08 Apr Shift 1)

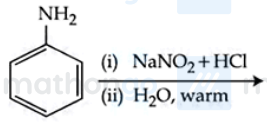
Number of amine compounds from the following giving solids which are soluble in NaOH upon reaction with Hinsberg's reagent is _____

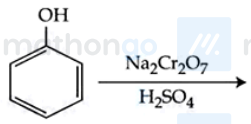


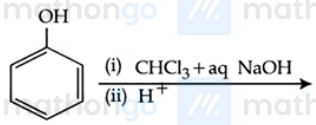
Q12 - 2024 (08 Apr Shift 2)

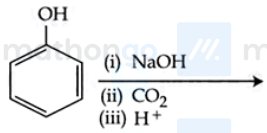
Match List - I with List - II.

List - I (Reactions)

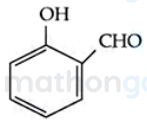
(A) 

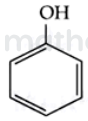
(B) 

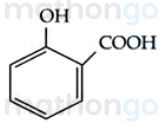
(C) 

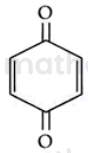
(D) 

List - II (Products)

(I) 

(II) 

(III) 

(IV) 

Choose the correct answer from the options given below :

(1) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

(2) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

(3) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

(4) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Q13 - 2024 (08 Apr Shift 2)

Given below are two statements :

Statement (I) : All the following compounds react with p-toluenesulfonyl chloride.

$C_6H_5NH_2$ $(C_6H_5)_2NH$ $(C_6H_5)_3N$

Statement (II) : Their products in the above reaction are soluble is aqueous NaOH. In the light of the above statements, choose the correct answer from the options given below

(1) Statement I is false but Statement II is true

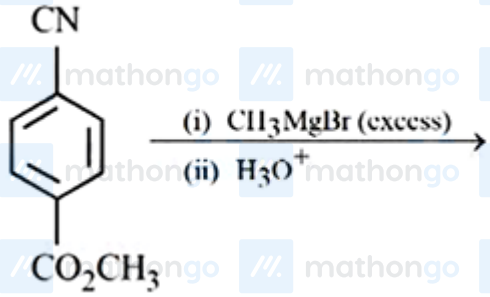
(2) Statement I is true but Statement II is false

(3) Both Statement I and Statement II are true

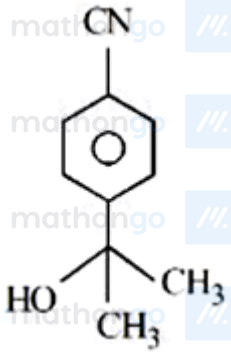
(4) Both Statement I and Statement II are false

Q14 - 2024 (09 Apr Shift 2)

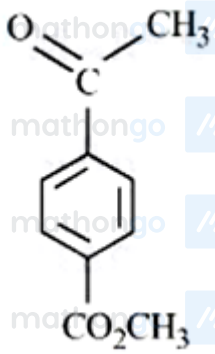
Major product of the following reaction is



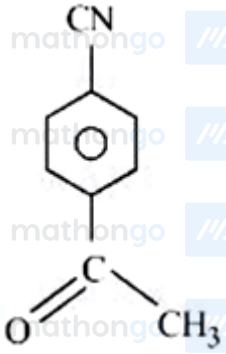
(1)

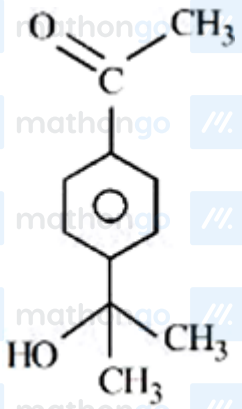


(2)



(3)





(4)

Answer Key

Q1 (45) **Q2** (3) **Q3** (8) **Q4** (95)

Q5 (9) **Q6** (20) **Q7** (4) **Q8** (15)

Q9 (287) **Q10** (591) **Q11** (5) **Q12** (4)

Q13 (4) **Q14** (4)

Q1

$$\underset{\text{Mol.wt.45g}}{CH_3CH_2NH_2} \xrightarrow{NaNO_2+HCl\ \ H_2O} CH_3CH_2-OH + \underset{14\ g}{N_2}$$

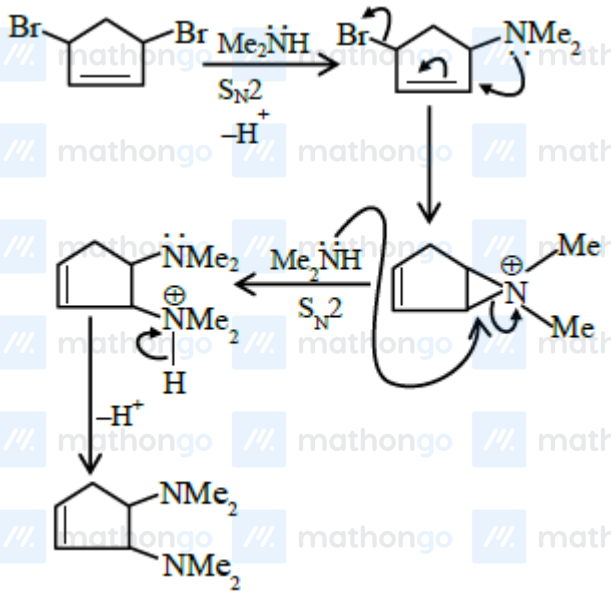
given : N_2 evolved is 2.24 L i.e. 0.1 mole.

i.e. $CH_3CH_2NH_2$ (ethyl amine) will be 4.5 g

$(= 0.1$ mole)

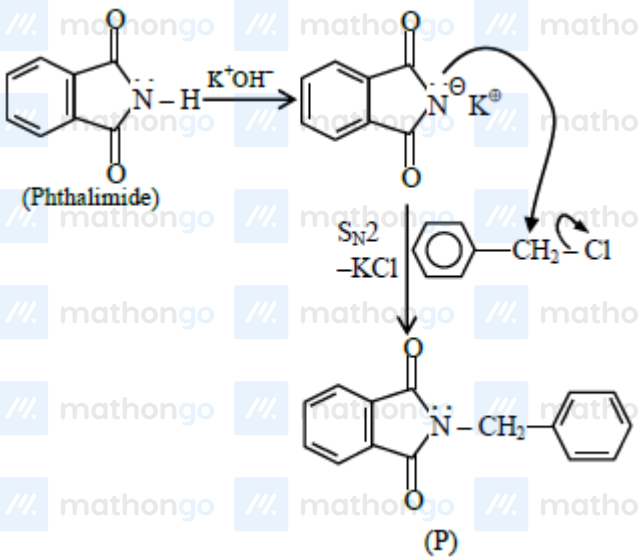
Hence the answer $= 45 \times 10^{-1}$ g

Q2



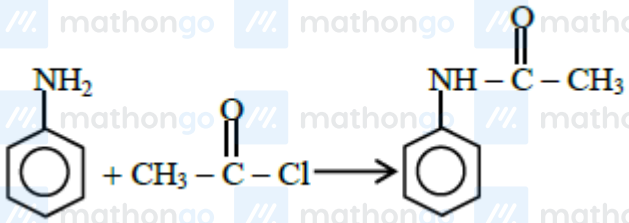
The above mechanism valid for both cis and trans isomers. So the products are same for both cis and trans isomers.

Q3



Total number of π-bonds present in product P is 8

Q4

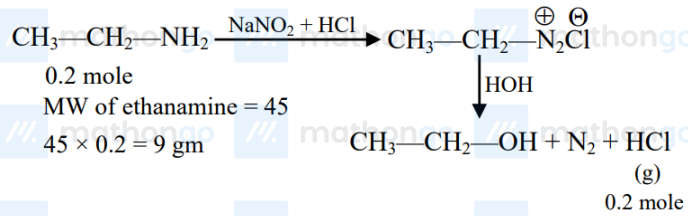


93 g aniline form 135gm acetanlide

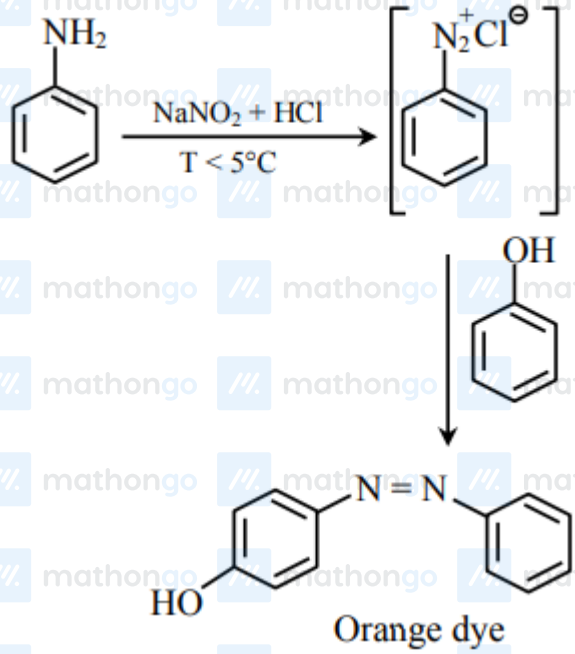
so 6.55 g anilne form $\frac{135}{93} \times 6.55 = 9.5$

95×10^{-1}

Q5



Q6



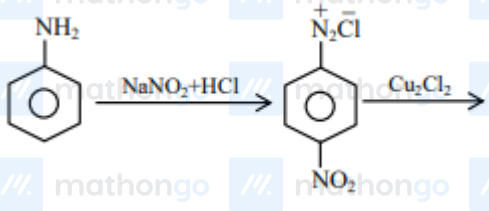
Reaction suggests that 1 mole of aniline give 1 mole of orange dye.

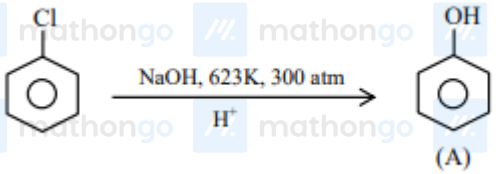
$$\text{so } (\text{mol})_{\text{aniline}} = (\text{mole})_{\text{orange dye}}$$

$$\frac{9.3\text{ g}}{93\text{ g mol}^{-1}} = \frac{\text{mass of orange dye}}{199\text{ g mol}^{-1}}$$

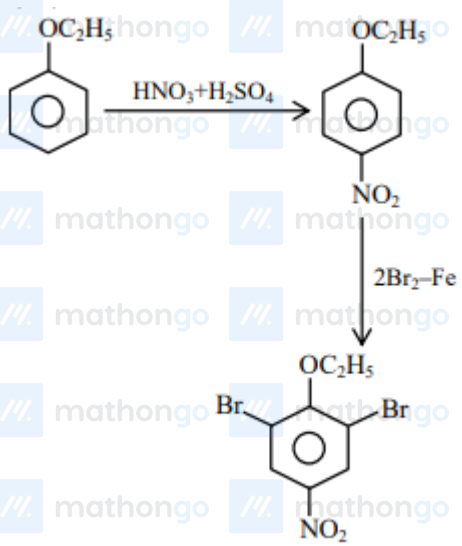
$$\text{mass of orange dye} = 19.9\text{ g} \simeq 20\text{ g}$$

Q7

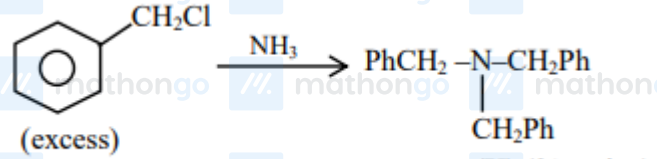




Q8

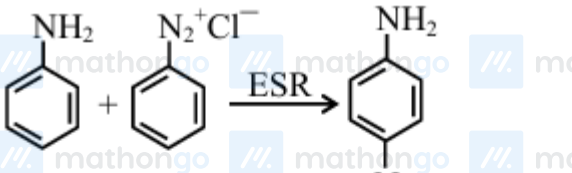


Q9



Molar Mass of (X) is 287 g mol^{-1}

Q10



m.wt.=93

given wt.=279gm

moles = $\frac{279}{93}$ =3

moles formed =3

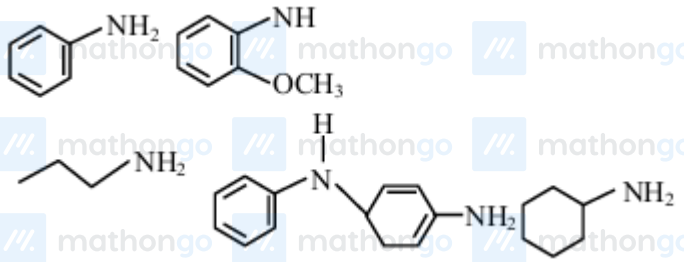
m.wt. = 197

amount formed

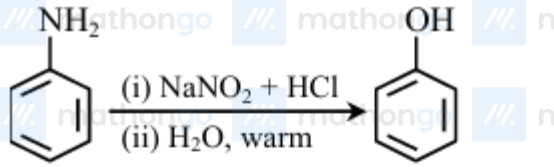
=197 × 3 = 591 gm

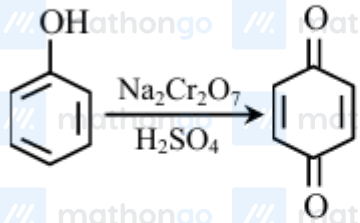
Q11

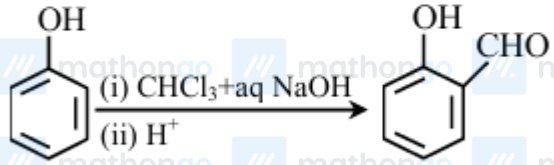
Primary amine give an ionic solid upon reaction with Hinsberg reagent which is soluble in NaOH.

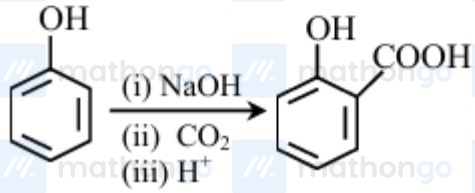


Q12









Q13

Hinsberg test given by 1° amine only.

Q14