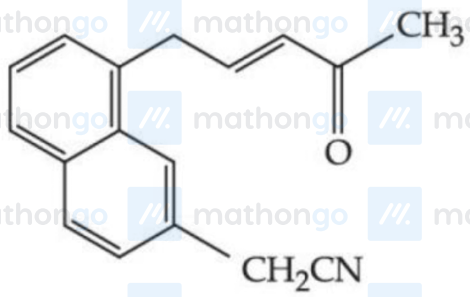
Q1 - 24 June - Shift 1

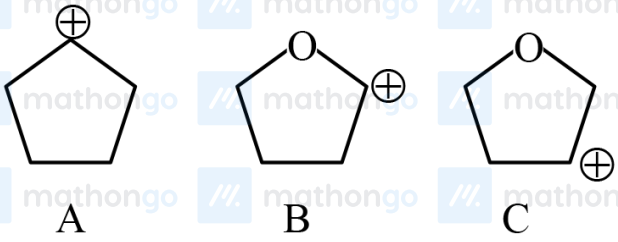
Number of electrophilic centre in the given compound is ____



Space for your notes:

Q2 - 24 June - Shift 2

Arrange the following carbocations in decreasing order of stability.



A B C

(A) A > C > B (B) A > B > C

(C) C > B > A (D) C > A > B

Space for your notes:

Q3 - 24 June - Shift 2

0.2 g of an organic compound was subjected to estimation of nitrogen by Dumas method in which volume of N_2 evolved (at STP) was found to be 22.400 mL. The percentage of nitrogen in the compound is____.[nearest integer]

(Given: Molar mass of N_2 is 28 mol^{-1}. Molar volume of N_2 at STP : 22.4 L)

Space for your notes:

Q4 - 25 June - Shift 1

Phenol on reaction with dilute nitric acid, gives two products. Which method will be most effective for large scale separation ?

(A) Chromatographic separation

(B) Fractional Crystallisation

(C) Steam distillation

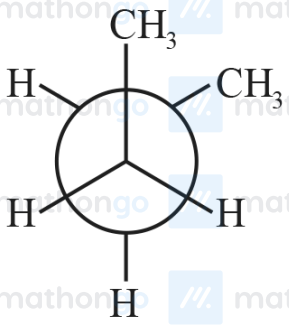
(D) Sublimation

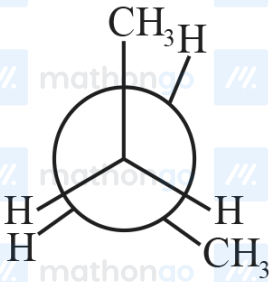
Space for your notes:

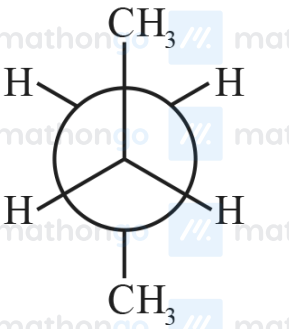
Q5 - 25 June - Shift 1

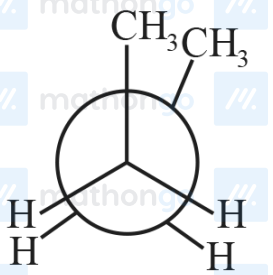
In the following structures, which one is having staggered conformation with maximum dihedral angle?

Space for your notes:

(A) 

(B) 

(C) 

(D) 

Q6 - 25 June - Shift 1

The IUPAC name of ethylidene chloride is :-

(A) 1-Chloroethene

(B) 1-Chloroethyne

(C) 1,2-Dichloroethane

(D) 1,1-Dichloroethane

Space for your notes:

Q7 - 25 June - Shift 2

Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R.**

Assertion A: A mixture contains benzoic acid and napthalene. The pure benzoic acid can be separated out by the use of benzene.

Reason R: Benzoic acid is soluble in hot water.

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

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is NOT the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Space for your notes:

Q8 - 26 June - Shift 1

Given below are two statements :

Statement I : In 'Lassaigne's Test, when both nitrogen and sulphur are present in an organic compound, sodium thiocyanate is formed.

Statement II : If both nitrogen and sulphur are present in an organic compound, then the excess of sodium used in sodium fusion will decompose the sodium thiocyanate formed to give NaCN and Na_2S.

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

(A) Both **Statement I** and **Statement II** are correct.

(B) Both **Statement I** and **Statement II** are incorrect.

(C) **Statement I** is correct but **Statement II** is incorrect.

(D) **Statement I** is incorrect but **Statement II** is correct.

Space for your notes:

Q9 - 26 June - Shift 1

Compound 'P' on nitration with dil. HNO_3 yields two isomers (A) and (B). These isomers can be separated by steam distillation. Isomers (A) and (B) show the intramolecular and intermolecular hydrogen bonding respectively. Compound (P) on reaction with conc. HNO_3 yields a yellow compound 'C', a strong acid. The number of oxygen atoms is present in compound 'C' _____.

Space for your notes:

Q10 - 26 June - Shift 2

The correct order of nucleophilicity is

(1) $F^- > OH^-$

(2) $H_2\ddot{O} > OH^-$

(3) $R\ddot{O}H > RO^-$

(4) $NH_2^- > NH_3$

Space for your notes:

Q11 - 27 June - Shift 1

Total number of possible stereoisomers of dimethyl cyclopentane is _____

Space for your notes:

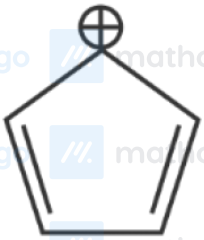
Q12 - 27 June - Shift 2

Which of the following is most stable?

Space for your notes:

(A) 

(B) 

(C) 

(D) 

Q13 - 27 June - Shift 2

0.25 g of an organic compound containing chlorine gave 0.40 g of silver chloride in Carius estimation. The percentage of chlorine present in the compound is _____. [in nearest integer]

(Given: Molar mass of Ag is 108 g mol^{-1} and that of Cl is 35.5 g mol^{-1})

Space for your notes:

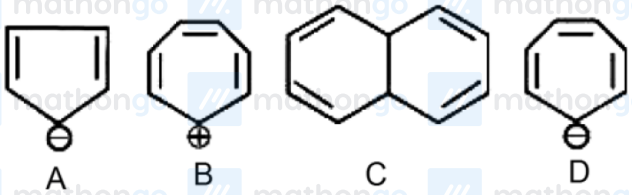
Q14 - 28 June - Shift 1

Which one of the following techniques is not used to spot components of a mixture separated on thin layer chromatographic plate?
(A) I_2 (Solid)
(B) U.V. Light
(C) Visualisation agent as a component of mobile phase
(D) Spraying of an appropriate reagent

Space for your notes:

Q15 - 28 June - Shift 1

Which of the following structures are aromatic in nature?



(A) A,B,C and D
(B) Only A and B
(C) Only A and C
(D) Only B, C and D

Space for your notes:

Q16 - 28 June - Shift 1

The formula of the purple colour formed in Laissaigne's test for sulphur using sodium nitroprusside is

(A) $NaFe[Fe(CN)_6]$ (B) $Na[Cr(NH_3)_2(NCS)_4]$

(C) $Na_2[Fe(CN)_5(NO)]$ (D) $Na_4[Fe(CN)_5(NOS)]$

Space for your notes:

Q17 - 28 June - Shift 1

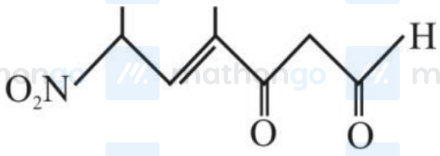
In the estimation of bromine, 0.5 g of an organic compound gave 0.40 g of silver bromide. The percentage of bromine in the given compound is _____% (nearest integer)

(Relative atomic masses of Ag and Br are 108u and 80u, respectively).

Space for your notes:

Q18 - 28 June - Shift 2

The correct IUPAC name of the following compound is :



(A) 4-methyl-2-nitro-5-oxohept-3-enal

(B) 4-methyl-5-oxo-2-nitrohept-3-enal

(C) 4-methyl-6-nitro-3-oxohept-4-enal

(D) 6-formyl-4-methyl-2-nitrohex-3-enal

Space for your notes:

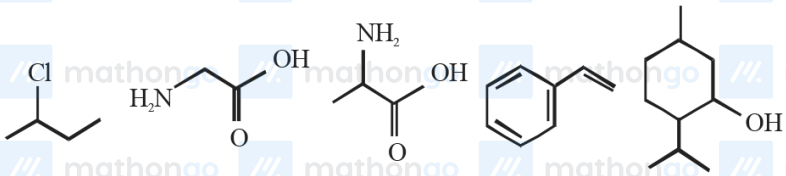
Q19 - 29 June - Shift 1

Kjeldahl's method was used for the estimation of nitrogen in an organic compound. The ammonia evolved from 0.55 g of the compound neutralised 12.5 mL of 1 M H_2SO_4 solution. The percentage of nitrogen in the compound is _____. (Nearest integer)

Space for your notes:

Q20 - 29 June - Shift 1

Observe structures of the following compounds

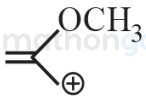


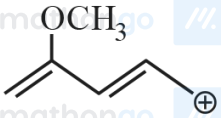
The total number of structures/compounds which possess asymmetric carbon atoms is _____.

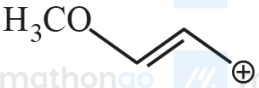
Space for your notes:

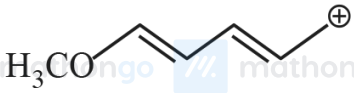
Q21 - 29 June - Shift 2

Which of the following carbocations is most stable :

(A) 

(B) 

(C) 

(D) 

Space for your notes:

Q22 - 29 June - Shift 2

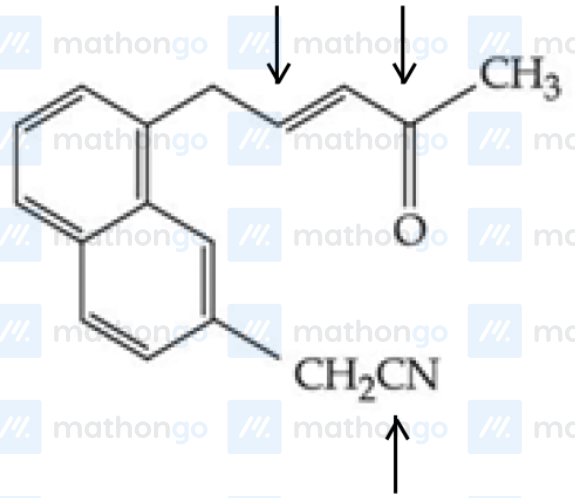
The number of chiral alcohol(s) with molecular formula $C_4H_{10}O$ is_____.

Space for your notes:

Answer Key

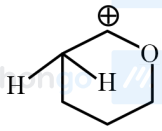
Q1 (3)	**Q2** (A)	**Q3** (14)	**Q4** (C)
Q5 (C)	**Q6** (D)	**Q7** (D)	**Q8** (A)
Q9 (7)	**Q10** (D)	**Q11** (5)	**Q12** (A)
Q13 (40)	**Q14** (C)	**Q15** (B)	**Q16** (D)
Q17 (34)	**Q18** (C)	**Q19** (64)	**Q20** (3)
Q21 (D)	**Q22** (1)		

Q1 (3)



Q2 (A)

Carbocation is stabilised by resonance with lone pairs on oxygen atom and +H effect of 2a hydrogens



B > A > C

Q3 (14)

weight of organic compound = 0.2g

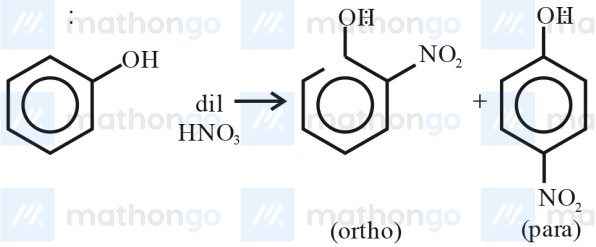
$$\text{mass of } N_2(g) \text{ evolved} = \frac{22.4\times10^{-3}}{22.4}\times 28$$

$$= 28 \times 10^{-3} g$$

$$\% \text{ of } N = \frac{28\times10^{-3}}{0.2}\times 100 = 14$$

Q4 (C)

:



Para product has higher boiling point than ortho as intermolecular H-bond is possible in former, where as intramolecular H-bond is possible in ortho product.

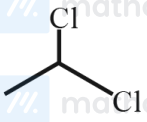
Steam distillation can separate them as ortho product is steam volatile.

Q5 (C)

Dihedral angle : It's the angle b/w 2 specified groups ($-CH_3$ here)

Staggered form is Given in option (C) & the angle is 180^0

Q6 (D)



"1, 1-Dichloroethane is Ethylidene chloride"

Q7 (D)

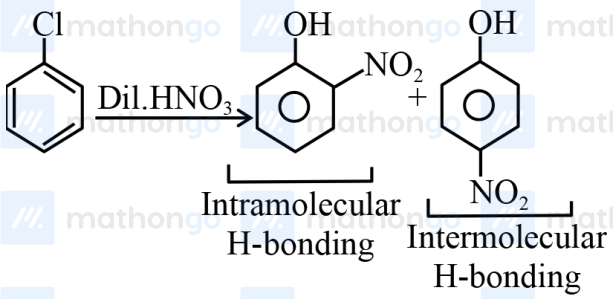
Benzoic acid and Napthalene can be effectively separated by crystallization. Benzoic acid is soluble in hot water whereas Napthalene is insoluble.

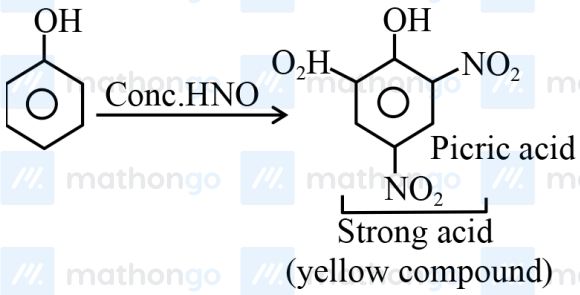
Hence assertion is incorrect but reason is correct

Q8 (A)

Both statement I & statement II are correct.

Q9 (7)





Q10 (D)

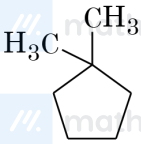
Nucleophilicity $\propto$ electro density on donor atom

$\propto$ size of donor atom (in gas)

$\propto \frac{1}{\text{EN of atom}}$ (for period)

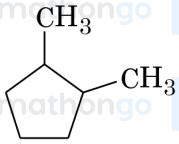
Q11 (5)

Dimethyl cyclopentane



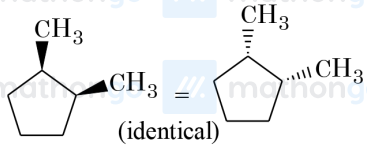
1,1-dimethylcyclopentane

no stereoisomer

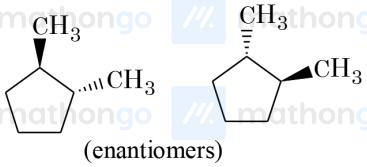


1,2-dimethylcyclopentane

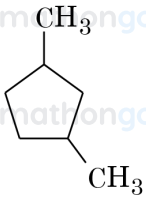
will show stereo isomerism, Its stereo isomers are



(identical)

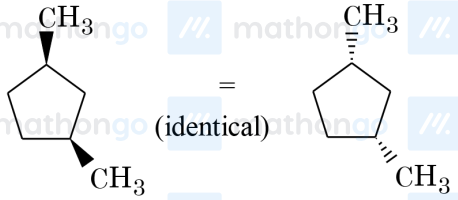


(enantiomers)

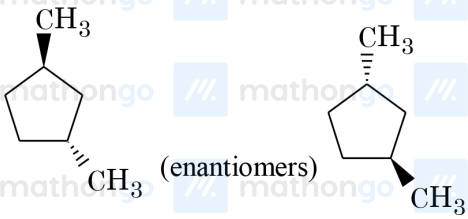


1,3-dimethylcyclopentane

will show stereo isomerism, Its stereo isomers are



(identical)



(enantiomers)

Q12 (A)


is most stable as it is aromatic.

Q13 (40)

wt. of organic compound = 0.25 g

$$\text{mass of Cl} = \frac{35.5}{143.5} \times 0.4\text{g}$$

mass % of Cl in the organic compound

$$= \frac{35.5 \times 0.4}{143.5 \times 0.25} \times 100$$

$$= 39.58\%$$

Q14 (C)

The function of mobile phase is to carry the components present on TLC.

Q15 (B)

A, B aromatic

C,D is nonaromatic

Q16 (D)

$$Na_2S + Na_2[Fe(CN)_5NO] \rightarrow Na_4[Fe(CN)_5NO_5]$$

Q17 (34)

$$O.C \longrightarrow AgBr$$

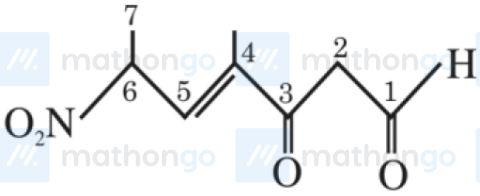
$$0.5\,g \qquad 0.4\,g$$

$$\text{mol of Br} = \text{mol of AgBr} = \frac{0.4}{188}$$

$$\%\ \text{Br} = \%\text{Br} = \frac{\frac{0.4}{188}\times 80}{0.5}\times 100$$

$$= 34.04\%$$

Q18 (C)



4-Methyl-6-nitro-3-oxohept-4-enal

Q19 (64)

Meq of H_2SO_4 used by NH_3 = $12.5 \times 1 \times 2 = 25$

$$\%\ \text{of N in the compound} = \frac{25\times 10^{-3}\times 14\times 100}{0.55} = 63.6$$

or

Meq. of H_2SO_4 = Meq. of NH_3

$12.5 \times 1 \times 2 = 25\ m_{eq.}$ of NH_3

= 25 millimoles of NH_3

So Millimoles of 'N' = 25

Moles of 'N' = 25×10^{-3}

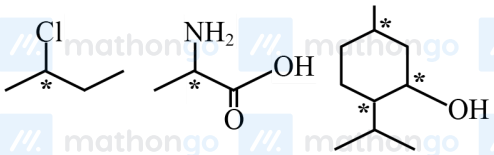
wt. of N = $14 \times 25\times 10^{-3}$

$$\%N = \frac{14\times 25\times 10^{-3}}{0.55}\times 100$$

= 63.66

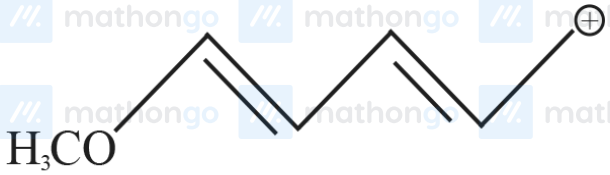
≈ 64%

Q20 (3)



Number of compounds containing asymmetric carbons are three.

Q21 (D)



Is most stable carbocation

Q22 (1)

$CH_3 - CH_2 - CH_2 - CH_2 - OH$

$CH_3 - \underset{\underset{OH}{|}}{\overset{\bigstar}{C}}H - CH_2 - CH_3 \quad (\pm)$

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

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

Out of which only two are chiral