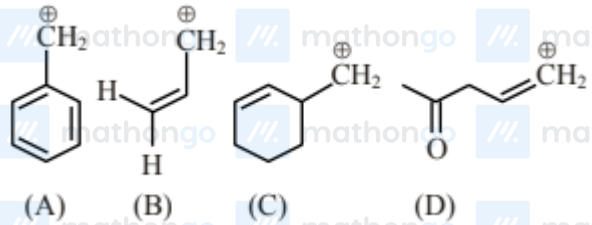
Q1 (20 July 2021 Shift 1)



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

Among the given species the Resonance stabilised carbocations are:

(1) (C) and (D) only

(2) (A), (B) and (D) only

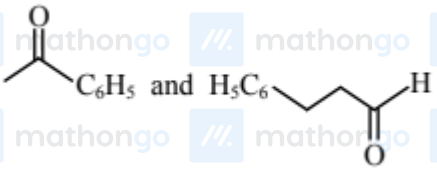
(3) (A) and (B) only

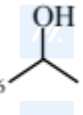
(4) (A), (B) and (C) only

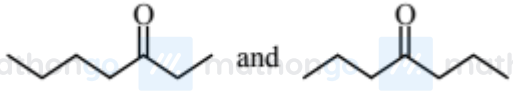
Q2 (20 July 2021 Shift 2)

Which one of the following pairs of isomers is an example of metamerism ?

(1) $CH_3CH_2CH_2CH_2CH_3$ and $H_3C-\underset{\displaystyle CH_3}{\overset{\displaystyle CH}{\underset{|}{\overset{|}{C}}}}-CH_3$

(2) C_6H_5 and H_5C_6 

(3) H_5C_6 OH and H_5C_6 

(4)  and

Q3 (20 July 2021 Shift 2)

In Carius method, halogen containing organic compound is heated with fuming nitric acid in the presence of :

(1) HNO_3

(2) $AgNO_3$

(3) $CuSO_4$

(4) $BaSO_4$

Q4 (20 July 2021 Shift 2)

When 0.15 g of an organic compound was analyzed using Carius method for estimation of bromine, 0.2397 g of AgBr was obtained. The percentage of bromine in the organic compound is ___ (Nearest integer)

[Atomic mass: Silver = 108, Bromine = 80]

Q5 (22 July 2021 Shift 1)

Which purification technique is used for high boiling organic liquid compound (decomposes near its boiling point)?

(1) Simple distillation

(2) Steam distillation

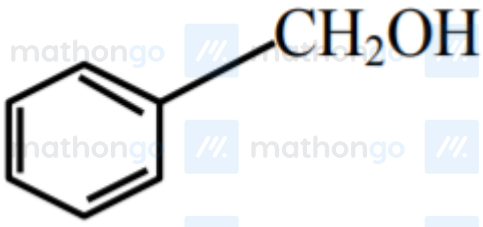
(3) Fractional distillation

(4) Reduced pressure distillation

Q6 (22 July 2021 Shift 1)

Which of the following compounds does not exhibit resonance?

(1) $CH_3CH_2OCH = CH_2$

(2) 

(3) $CH_3CH_2CH_2CONH_2$

(4) $CH_3CH_2CH = CHCH_2NH_2$

Q7 (22 July 2021 Shift 1)

Which of the following molecules does not show stereo isomerism ?

(1) 3,4 -Dimethylhex-3-ene

(2) 3-Methylhex-1-ene

(3) 3-Ethylhex-3-ene

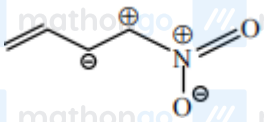
(4) 4-Methylhex-1-ene

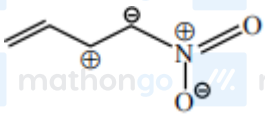
Q8 (22 July 2021 Shift 1)

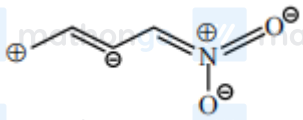
The number of acyclic structural isomers (including geometrical isomers) for pentene are

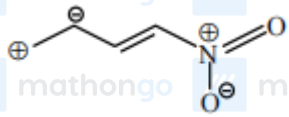
Q9 (25 July 2021 Shift 1)

Which one among the following resonating structures is not correct?

(1) 

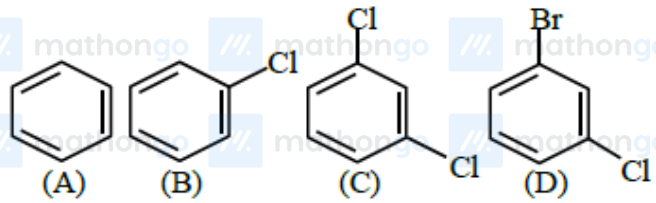
(2) 

(3) 

(4) 

Q10 (25 July 2021 Shift 2)

The correct decreasing order of densities of the following compounds is:



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

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

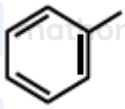
(3) (C) > (B) > (A) > (D)

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

Q11 (25 July 2021 Shift 2)

Which among the following is the strongest acid ?

(1) $CH_3CH_2CH_2CH3$

(2) 

(3) 

(4) 

Q12 (25 July 2021 Shift 2)

0.8 g of an organic compound was analysed by Kjeldahl's method for the estimation of nitrogen. If the percentage of nitrogen in the compound was found to be 42%, then mL of 1M H_2SO_4 would have been neutralized by the ammonia evolved during the analysis.

Q13 (27 July 2021 Shift 1)

Given below are two statements :

Statement I : Aniline is less basic than acetamide.

Statement II : In aniline, the lone pair of electrons on nitrogen atom is delocalised over benzene ring due to resonance and hence less available to a proton.

Choose the most appropriate option ;

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

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

(3) Both statement I and statement II are true.

(4) Both statement I and statement II are false.

Q14 (27 July 2021 Shift 1)

Staggered and eclipsed conformers of ethane are :

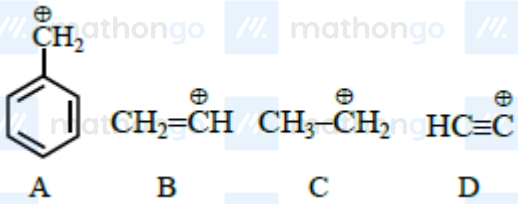
(1) Polymers

(2) Rotamers

(3) Enantiomers

(4) Mirror images

Q15 (27 July 2021 Shift 1)



The correct order of stability of given carbocation is:

(1) A > C > B > D

(2) D > B > C > A

(3) D > B > A > C

(4) $C > A > D > B$

Q16 (27 July 2021 Shift 1)

An organic compound is subjected to chlorination to get compound A using 5.0 g of chlorine. When 0.5 g of compound A is reacted with $AgNO_3$ [Carius Method], the percentage of chlorine in compound A is when it forms 0.3849 g of AgCl. (Round off to the Nearest Integer)

(Atomic masses of Ag and Cl are 107.87 and 35.5 respectively)

Q17 (27 July 2021 Shift 2)

Which one of the following set of elements can be detected using sodium fusion extract?

(1) Sulfur, Nitrogen, Phosphorous, Halogens

(2) Phosphorous, Oxygen, Nitrogen, Halogens

(3) Nitrogen, Phosphorous, Carbon, Sulfur

(4) Halogens, Nitrogen, Oxygen, Sulfur

Q18 (27 July 2021 Shift 2)

Given below are two statements:

Statement I : Hyperconjugation is a permanent effect.

Statement II : Hyperconjugation in ethyl cation $(CH_3 - CH_2)$ involves the overlapping of $C_{q^2} - H_{ls}$ bond with empty 2p orbital of other carbon.

Choose the correct option :

(1) Both statement I and statement II are false

(2) Statement I is incorrect but statement II is true

(3) Statement **I** is correct but statement II is false

(4) Both Statement I and statement II are true.

Q19 (27 July 2021 Shift 2)

The dihedral angle in staggered form of Newman projection of 1, 1, 1 -Trichloro ethane is ..... degree.

(Round off to the nearest integer)

(Round off to the nearest integer)

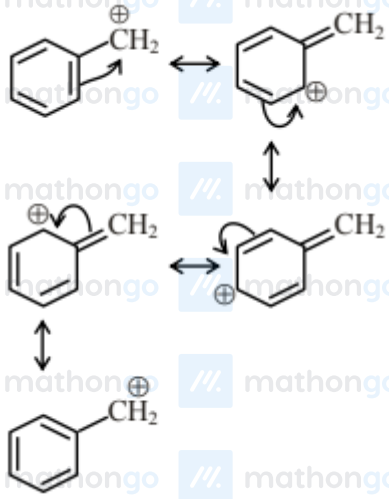
Answer Key

Q1 (3)	**Q2** (4)	**Q3** (2)	**Q4** (68)
Q5 (4)	**Q6** (4)	**Q7** (3)	**Q8** (6)
Q9 (1)	**Q10** (1)	**Q11** (4)	**Q12** (12)
Q13 (2)	**Q14** (2)	**Q15** (1)	**Q16** (19)
Q17 (1)	**Q18** (3)	**Q19** (60)	

Q1

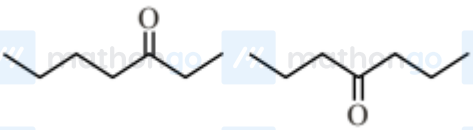
(A) and (B) only in Resonance

(A)



(B)

Q2



are metamers.

Q3

Organic compound is heated with fuming nitric acid in the presence of silver nitrate in carius method. Lunar caustic $(AgNO_3)$ is used as reagent hare to distinguish Cl^-, Br and I^- respectively as follows.

$Cl^-(aq) \xrightarrow{AgNO_3} AgCl\downarrow_{ppt}$ white

$Br^{-}(aq) \xrightarrow{A\,eNo_3} AgBr \downarrow_{ppt}$ pale yellow

$I(aq) \xrightarrow{AgNO_3} AgI \downarrow_{ppt}$ Dark yellow

Q4

Moles of Br = Moles of AgBr obtained

$\Rightarrow$ Mass of Br $= \frac{0.2397}{188} \times 80$ g

therefore %Br in the organic compound

$= \frac{W_{Br}}{W_T} \times 100$

$= \frac{0.2397 \times 80}{188 \times 0.15} \times 100 = 0.85 \times 80$

$= 68$

$\Rightarrow$ Nearest integer is '68'

Q5

Reduced pressure distillation or vacuum distillation is used for the purification of high boiling organic liquids which decomposes at or below their boiling point.

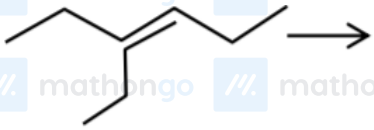
Q6

$CH_3 - CH_2 - CH = CH - CH_2 - NH_2$

No conjugation thus resonance is not possible.

Q7

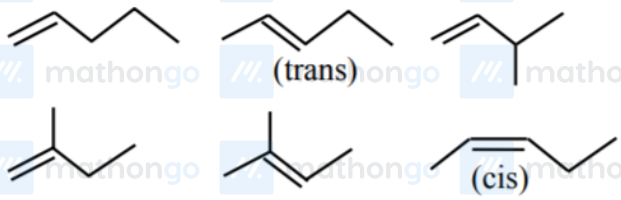
3-Ethylhex-3-ene will not show stereo isomerism it's diagram is.



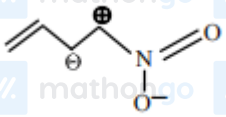
(1) Not show geometrical isomerism

(2) Not show optical isomerism

Q8



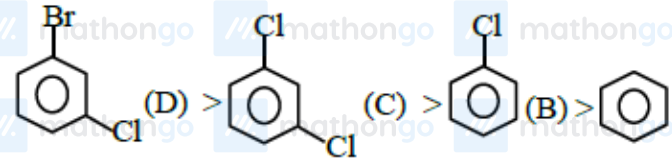
Q9



It is unstable RS (due to similar charge on adjacent atom)

Q10

The density order



Q11

Strongest acid

because its conjugate base is aromatic

Q12

Organic compound : 0.8gm wt. of N $= \left(\frac{42}{100} \times 0.8\right)$ gm

mole of N $= \frac{42 \times 0.8}{100 \times 14} = \frac{2.4}{100}$ mol

moles of $NH_3 = \frac{2.4}{100}$

$$2NH_3 + \quad H_2SO_4 \longrightarrow (NH_4)_2SO_4$$

$\downarrow$

$\frac{2.4}{100}$ mole $\quad \frac{1.2}{100}$ mole

$\frac{1.2}{100} = 1 \times V(\ell)$

$\Rightarrow V_{H_2SO_4} = \frac{1.2}{100}\ell = 12\ m\ell$

Q13

Explanation :- aniline is more basic than acetamide because in acetamide, lone pair of nitrogen is delocalised to more electronegative element

oxygen.

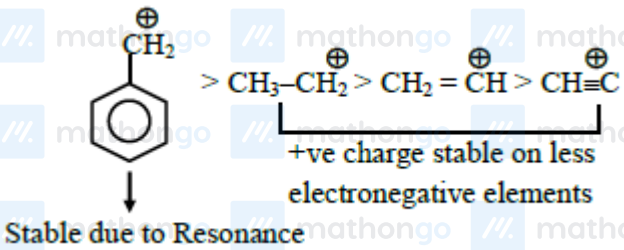
In Aniline lone pair of nitrogen delocalised over benzene ring

Q14

Staggered and eclipsed conformers of ethane also

known as rotamers

Q15



Q16

Mass of organic compound $= 0.5$gm. mass of formed $AgCl = 0.3849$gm

$$\% \text{ of Cl} = \frac{\text{atomic mass of Cl} \times \text{ mass formed AgCl}}{\text{molecular mass of AgCl} \times \text{ mass of organic compound}} \times 100$$

$$= \frac{35.5 \times 0.3849}{143.37 \times 0.5} \times 100$$

$$= 19.06$$

$$\approx 19$$

Q17

By sodium fusion extract we can detect sulphur, nitrogen, Phosphorous and halogens, because they are converted in to their ionic form with sodium metal.

Q18

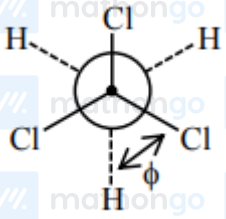
Statement I : It is correct statement

Statement II : $CH_3 - CH_2$ involve $C_{sp^3} - H_{1s}$

bond with empty 2 p orbital hence given statement is false.

Q19

$1,1,1-$ Trichloro ethane $[CCl_3 - CH_3]$



Dihedral angle $(\phi) = 60^\circ$

(Newmonns stqqared form)