JEE Main Archive	DTS-3

31.(A) cis compound having resultant dipole moment will be most polar.

32.(C) Moles of HCl reacting with ammonia = (moles of HCl absorbed) − (moles of NaOH solution required)

$= (20 \times 0.1 \times 10^{-3}) - (15 \times 0.1 \times 10^{-3})$

= moles of NH_3 evolved

= moles of nitrogen in organic compound

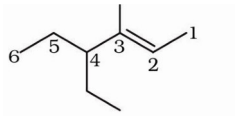
$\therefore$ Weight of nitrogen in organic compound $= 0.5 \times 10^{-3} \times 14 = 7 \times 10^{-3}$ g

$$\% \text{ of N in the compound} = \frac{7 \times 10^{-3}}{29.5 \times 10^{-3}} \times 100$$

33.(B) 2-pentanone exhibits tautomerism

$$CH_3 - \overset{\overset{O}{\|}}{C} - CH_2 - CH_2 - CH_3 \rightleftharpoons CH_3 - \overset{\overset{OH}{|}}{C} = CH - CH_2 - CH_3$$

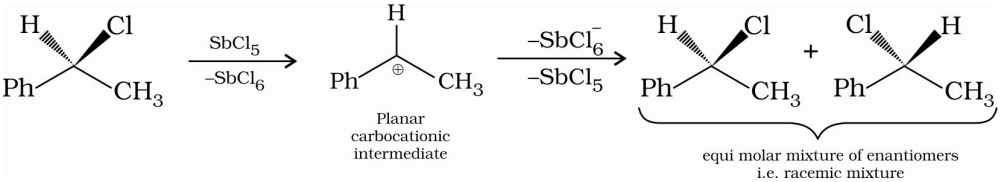
34.(C)



4-ethyl-3 methyl hex-2-ene

35.(D) Order of stability is III > I > II (stability increases with increase in delocalization).

36.(C)



37.(C) $C_xH_y + \left(x + \frac{y}{4}\right)O_2 \longrightarrow xCO_2 + \frac{y}{2}H_2O$

x = Number of mole of $CO_2 = \frac{3.08}{44} = 0.07$

y = Number of mole of $H_2O \times 2 = \frac{0.72}{18} \times 2 = 0.08$

x : y is 7 : 8. Hence formula is C_7H_8

38.(C) Eq. of NH_3 evolved = Eq. of NH_3 reacted with H_2SO_4

Eq. of NH_3 reacted = Eq. of H_2SO_4 used

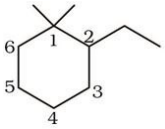
Eq. of H_2SO_4 used = initial eq. of H_2SO_4 – eq. of NaOH used.

$$= \left(\frac{1}{10} \times 2 \times \frac{60}{1000}\right) - \left(\frac{1}{10} \times 1 \times \frac{20}{1000}\right) = (0.012 - 0.002) = 0.01$$

Mole of N atoms = Mole of NH_3 evolved = Eq. of NH_3 evolved

Mass of N atoms = Mole of $N \times 14 = (0.01 \times 14)$ g,

$$\% \text{ of N atoms} = \frac{0.01 \times 14}{1.4} \times 100 = 10$$

39.(B) 

2-Ethyl-1, 1-dimethyl cyclohexane

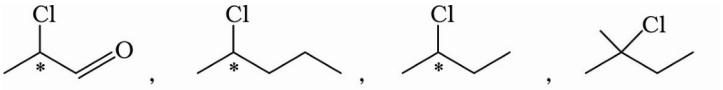
40.(A) Mass of organic compound = 250 mg

Mass of AgBr = 141mg

Mole of Br = mole of AgBr $= \frac{141}{188}$; Mass of Br $= \frac{141}{188} \times 80$

% of Bromine in organic compound $= \frac{\frac{80}{188} \times 141}{250} \times 100 = 24\,\%$

41.(D) Organic compound having chiral carbon atom is optically active.



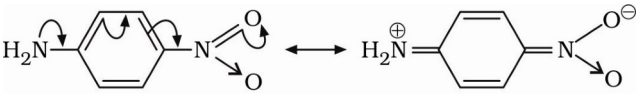
optically active optically active optically active optically inactive

42.(B) Aniline is nitrogen containing compound and produce blue colouration in Lassaigne's test for detection of nitrogen. Sulphur containing compound produce violet colouration with nitroprusside in Lassaigne's test for detection of sulphur.

Nitrogen and Sulphur containing organic compound produce red colour with $FeCl_3$ in Lassaigne's test.

43.(C) **(A)** Not isomers **(B)** Functional isomers **(C)** Positional isomers **(D)** Not isomers

44.(B) Because one of the contributing structure has higher value of dipole moment.



High dipole moment

45.(C) Steam distillation is preferred for separation of substances which are steam volatile and are immiscible with water.

Fractional distillation is used if the difference in boiling points of two liquids is not much. This technique is used to separate different fractions of crude oil in petroleum industry.

Distillation under reduced pressure is used to purify liquids having very high boiling points and those, which decompose at or below their boiling points. Glycerol can be separated from spent-lye in soap industry by using this technique

Simple distillation $\Rightarrow$ This technique is used to separate volatile liquids from nonvolatile impurities or liquids having sufficient difference in their boiling points.