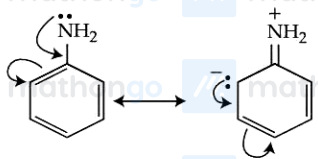
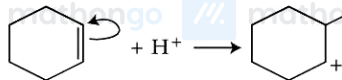
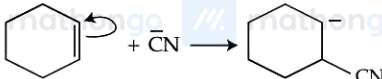
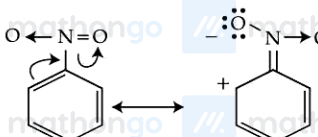


## Questions

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## Q1 - 2024 (04 Apr Shift 1)

Match List I with List II :

List - I Mechanism steps	List - II Effect
(A) 	(I) - E effect
(B) 	(II) - R effect
(C) 	(III) + E effect
(D) 	(IV) + R effect

Choose the correct answer from the options given below :

Choose the correct answer from the options given below :

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

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

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

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

## Q2 - 2024 (04 Apr Shift 1)

Which of the following nitrogen containing compound does not give Lassaigne's test?

(1) Urea

(2) Phenyl hydrazine

(3) Glycene

(4) Hydrazine

## Q3 - 2024 (04 Apr Shift 1)

Which among the following is incorrect statement?

## Questions

MathonGo

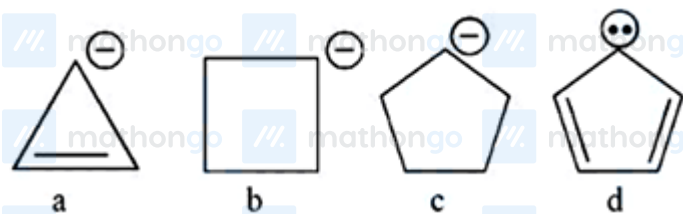
- (1) Electromeric effect dominates over inductive effect
- (2) The electromeric effect is, temporary effect
- (3) Hydrogen ion ( $H^+$ ) shows negative electromeric effect
- (4) The organic compound shows electromeric effect in the presence of the reagent only.

## Q4 - 2024 (04 Apr Shift 1)

The number of different chain isomers for  $C_7H_{16}$  is

## Q5 - 2024 (04 Apr Shift 2)

Correct order of stability of carbanion is -



- (1)  $d > a > c > b$
- (2)  $a > b > c > d$
- (3)  $d > c > b > a$
- (4)  $c > b > d > a$

## Q6 - 2024 (04 Apr Shift 2)

Common name of Benzene - 1, 2 - diol is -

- (1) catechol
- (2) o-cresol
- (3) quinol
- (4) resorcinol

## Q7 - 2024 (04 Apr Shift 2)

## Questions

MathonGo

The adsorbent used in adsorption chromatography is/are -

- A. silica gel
- B. alumina
- C. quick lime
- D. magnesia

Choose the most appropriate answer from the options given below :

- (1) A only
- (2) B only
- (3) C and D only
- (4) A and B only

**Q8 - 2024 (04 Apr Shift 2)**

The total number of 'sigma' and 'Pi' bonds in 2-oxohex-4-ynoic acid is \_\_\_\_\_

**Q9 - 2024 (05 Apr Shift 1)**

Number of  $\sigma$  and  $\pi$  bonds present in ethylene molecule is respectively :

- (1) 4 and 1
- (2) 5 and 2
- (3) 3 and 1
- (4) 5 and 1

**Q10 - 2024 (05 Apr Shift 1)**

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

Assertion (A) : Cis form of alkene is found to be more polar than the trans form.

Reason (R): Dipole moment of trans isomer of 2-butene is zero.

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

- (1) (A) is false but (R) is true

## Questions

MathonGo

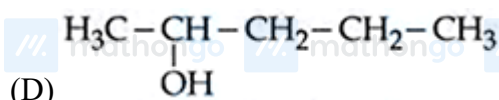
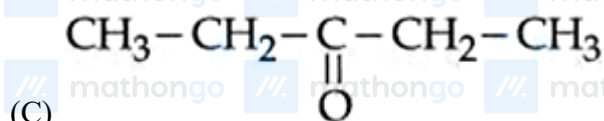
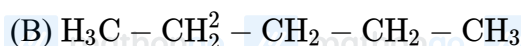
(2) Both (A) and (R) are true and (R) is the correct explanation of (A)

(3) (A) is true but (R) is false

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

## Q11 - 2024 (05 Apr Shift 1)

For the Compounds :



The increasing order of boiling point is :

Choose the correct answer from the options given below :

(1) (D) < (C) < (A) < (B)

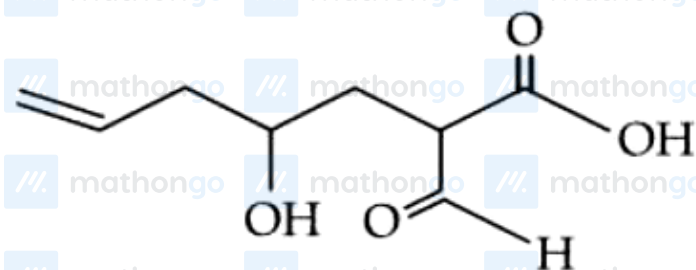
(2) (B) < (A) < (C) < (D)

(3) (A) < (B) < (C) < (D)

(4) (B) < (A) < (D) < (C)

## Q12 - 2024 (05 Apr Shift 2)

The correct nomenclature for the following compound is :



(1) 2-formyl-4-hydroxyhept-7-enoic acid

(2) 2-formyl-4-hydroxyhept-6-enoic acid

## Questions

MathonGo

(3) 2-carboxy-4-hydroxyhept-7-enal

(4) 2-carboxy-4-hydroxyhept-6-enal

## Q13 - 2024 (05 Apr Shift 2)

Match List I with List II

List - I

(Pair of compounds)

(A) n-propanol and Isopropanol

(B) Methoxypropane and ethoxyethane

(C) Propanone and propanal

(D) Neopentane and Isopentane

List - II

(Isomerism)

(I) Metamerism

(II) Chain Isomerism

(III) Position Isomerism

(IV) Functional Isomerism

Choose the correct answer from the options given below :

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

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

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

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

## Q14 - 2024 (05 Apr Shift 2)

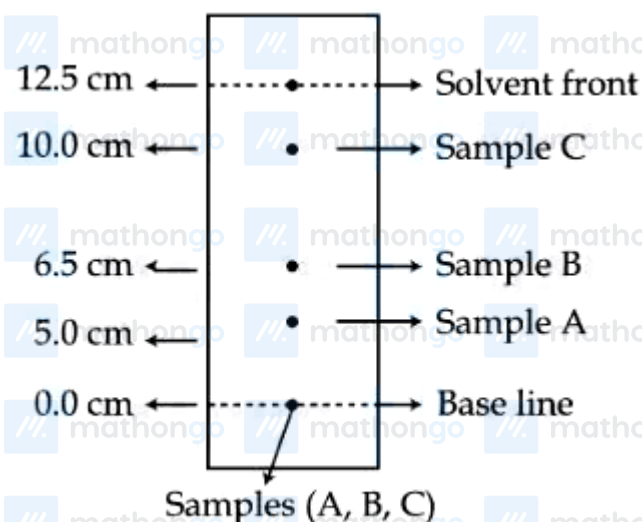
Using the given figure, the ratio of  $R_f$  values of sample A and sample C is  $x \times 10^{-2}$ . Value of  $x$  is \_\_\_\_\_

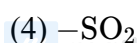
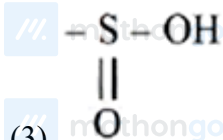
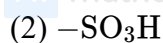
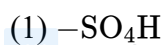
Fig : Paper chromatography of Samples

## Questions

MathonGo

Q15 - 2024 (06 Apr Shift 1)

Functional group present in sulphonic acids is :



Q16 - 2024 (06 Apr Shift 1)

Which of the following statements are correct?

A. Glycerol is purified by vacuum distillation because it decomposes at its normal boiling point.

B. Aniline can be purified by steam distillation as aniline is miscible in water.

C. Ethanol can be separated from ethanol water mixture by azeotropic distillation because it forms azeotrope.

D. An organic compound is pure, if mixed M.P. is remained same.

Choose the most appropriate answer from the options given below :

(1) A, B, C only

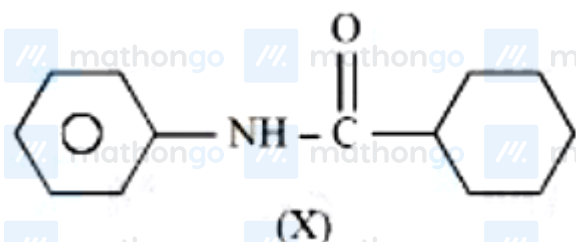
(2) A, C, D only

(3) A, B, D only

(4) B, C, D only

Q17 - 2024 (06 Apr Shift 1)

Which of the following is metamer of the given compound (X) ?



## Questions

MathonGo



## Q18 - 2024 (06 Apr Shift 2)

The correct statement among the following, for a "chromatography" purification method is :

- (1) Organic compounds run faster than solvent in the thin layer chromatographic plate.
- (2)  $R_f$  is an integral value.
- (3)  $R_f$  of a polar compound is smaller than that of a non-polar compound.
- (4) Non-polar compounds are retained at top and polar compounds come down in column chromatography.

## Q19 - 2024 (06 Apr Shift 2)

The incorrect statement regarding the geometrical isomers of 2-butene is :

- (1) cis-2-butene and trans-2-butene are not interconvertible at room temperature.
- (2) cis-2-butene and trans-2-butene are stereoisomers.
- (3) cis-2-butene has less dipole moment than trans-2-butene.
- (4) trans-2-butene is more stable than cis-2-butene.

## Questions

MathonGo

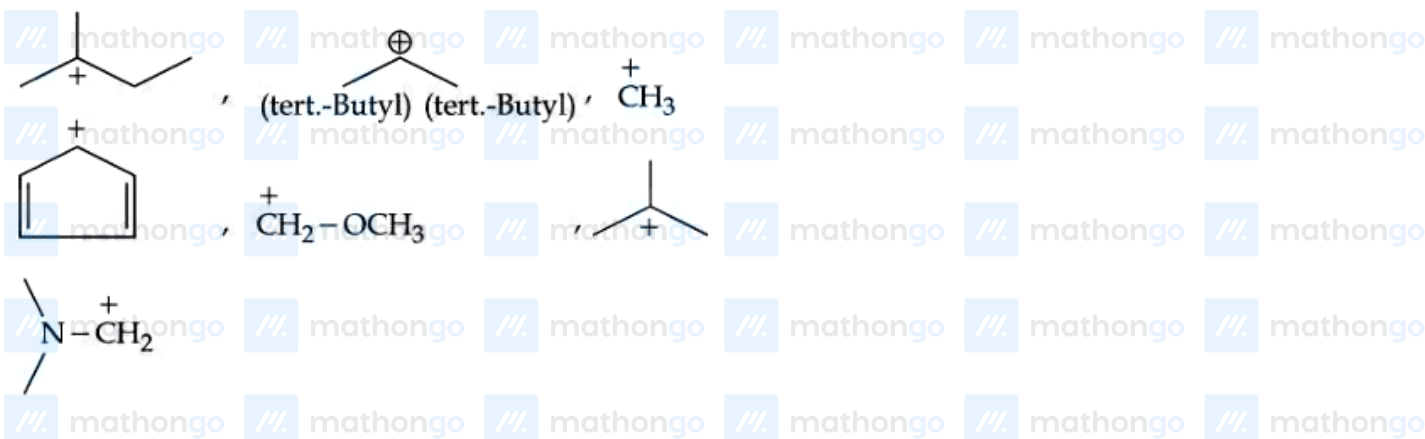
## Q20 - 2024 (06 Apr Shift 2)

Among  $\text{VO}_2^+$ ,  $\text{MnO}_4^-$  and  $\text{Cr}_2\text{O}_7^{2-}$ , the spin-only magnetic moment value of the species with least oxidising ability is \_\_\_\_\_ BM (Nearest integer).

(Given atomic number V = 23, Mn = 25, Cr = 24)

## Q21 - 2024 (06 Apr Shift 2)

Number of carbocations from the following that are not stabilized by hyperconjugation is \_\_\_\_\_



## Q22 - 2024 (08 Apr Shift 1)

Which of the following are aromatic?



## Questions

MathonGo

(1) A and C only

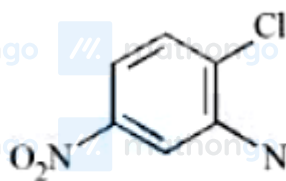
(2) B and D only

(3) C and D only

(4) A and B only

## Q23 - 2024 (08 Apr Shift 1)

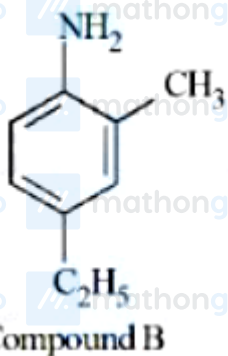
Given below are two statements:



Statements I:

Compound A

IUPAC name of Compound A is 4-chloro-1,3-dinitrobenzene.



Statements II:

Compound B

IUPAC name of Compound B is 4-ethyl-2-methylaniline.

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 incorrect.

(2) Both Statement I and Statement II are correct.

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

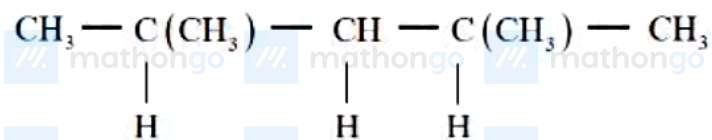
(4) Statement I is incorrect but Statement II is correct.

## Q24 - 2024 (08 Apr Shift 1)

## Questions

MathonGo

In the given compound, the number of 2° carbon atom /s is \_\_\_\_\_.



(1) Four

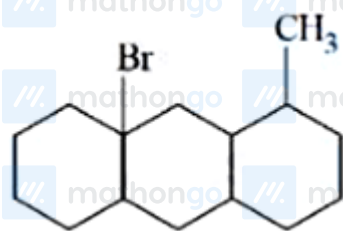
(2) Two

(3) One

(4) Three

## Q25 - 2024 (08 Apr Shift 1)

The number of optical isomers in following compound is: \_\_\_\_\_



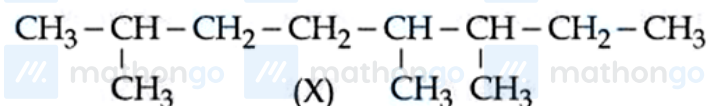
## Q26 - 2024 (08 Apr Shift 2)

The correct sequence of acidic strength of the following aliphatic acids in their decreasing order is:

(1)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{HCOOH}$ (2)  $\text{CH}_3\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH} > \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} > \text{HCOOH}$ (3)  $\text{HCOOH} > \text{CH}_3\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH} > \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ (4)  $\text{HCOOH} > \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH} > \text{CH}_3\text{COOH}$ 

## Q27 - 2024 (08 Apr Shift 2)

IUPAC name of following hydrocarbon (X) is:



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## Questions

MathonGo

(1) 2-Ethyl-3,6-dimethylheptane

(2) 2,5,6-Trimethyloctane

(3) 3,4,7-Trimethyloctane

(4) 2-Ethyl-2,6-diethylheptane

## Q28 - 2024 (08 Apr Shift 2)

Given below are two statements :

Statement (I) : Kjeldahl method is applicable to estimate nitrogen in pyridine.

Statement (II) : The nitrogen present in pyridine can easily be converted into ammonium sulphate in Kjeldahl method.

In the light of the above statements, choose the correct answer from the options given below

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

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

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

## Q29 - 2024 (08 Apr Shift 2)

In qualitative test for identification of presence of phosphorous, the compound is heated with an oxidising agent. Which is further treated with nitric acid and ammonium molybdate respectively. The yellow coloured precipitate obtained is :

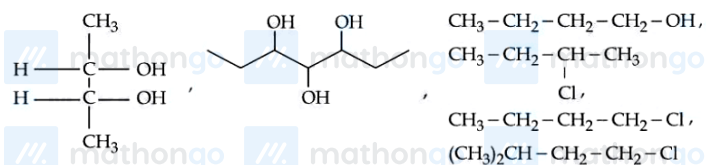
(1)  $\text{Na}_3\text{PO}_4 \cdot 12\text{MoO}_3$ (2)  $(\text{NH}_4)_3\text{PO}_4 \cdot 12\text{MoO}_3$ (3)  $\text{MoPO}_4 \cdot 21\text{NH}_4\text{NO}_3$ (4)  $(\text{NH}_4)_3\text{PO}_4 \cdot 12(\text{NH}_4)_2\text{MoO}_4$ 

## Q30 - 2024 (08 Apr Shift 2)

## Questions

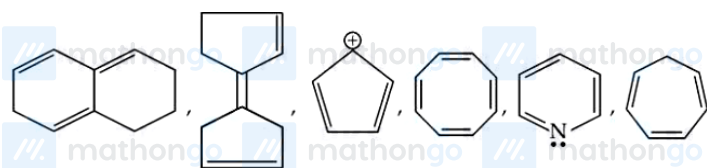
MathonGo

Total number of optically active compounds from the following is \_\_\_\_\_



## Q31 - 2024 (08 Apr Shift 2)

Total number of aromatic compounds among the following compounds is \_\_\_\_\_.



## Q32 - 2024 (09 Apr Shift 1)

Methods used for purification of organic compounds are based on :

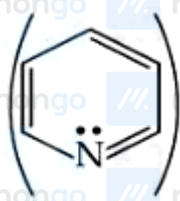
- (1) nature of compound and presence of impurity.
- (2) neither on nature of compound nor on the impurity present.
- (3) nature of compound only.
- (4) presence of impurity only.

## Q33 - 2024 (09 Apr Shift 1)

Correct order of basic strength of Pyrrole

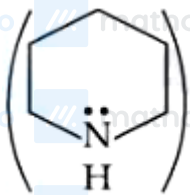


, Pyridine



## Questions

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, and Piperidine

is:

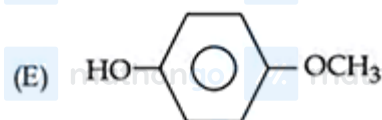
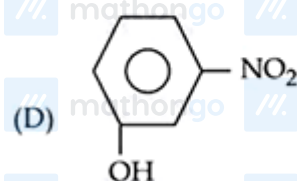
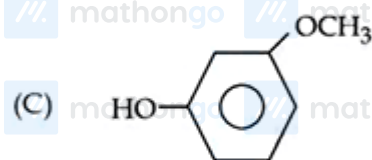
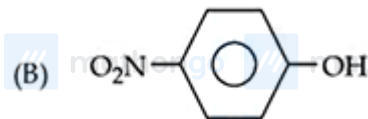
(1) Pyrrole &gt; Piperidine &gt; Pyridine

(2) Pyrrole &gt; Pyridine &gt; Piperidine

(3) Pyridine &gt; Piperidine &gt; Pyrrole

(4) Piperidine &gt; Pyridine &gt; Pyrrole

## Q34 - 2024 (09 Apr Shift 1)

For the given compounds, the correct order of increasing  $pK_a$  value :

Choose the correct answer from the options given below :

(1) (B) &lt; (D) &lt; (C) &lt; (A) &lt; (E)

(2) (D) &lt; (E) &lt; (C) &lt; (B) &lt; (A)

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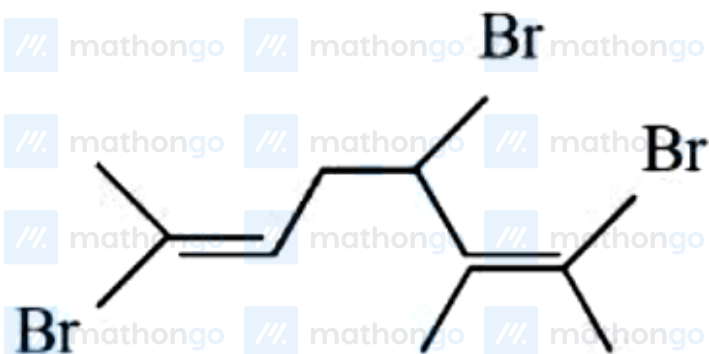
## Questions

MathonGo

(4) III &gt; II &gt; I

Q38 - 2024 (09 Apr Shift 2)

Total number of stereo isomers possible for the given structure :



(1) 2

(2) 4

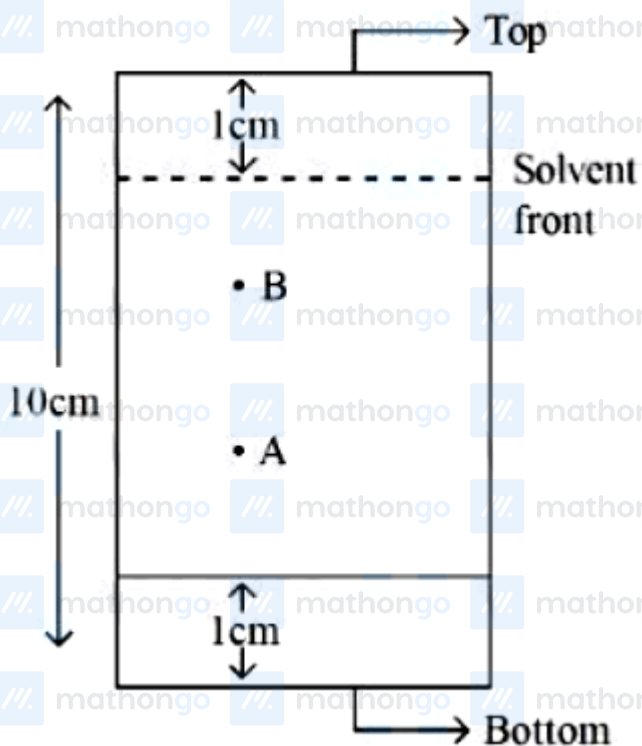
(3) 3

(4) 8

Q39 - 2024 (09 Apr Shift 2)

## Questions

MathonGo



In the given TLC, the distance of spot A & B are 5 cm & 7 cm, from the bottom of TLC plate, respectively.

$R_f$  value of B is  $x \times 10^{-1}$  times more than A. The value of  $x$  is \_\_\_\_\_.

## Questions

MathonGo

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**Answer Key**

/// mathongo // mathongo // mathongo // mathongo // mathongo // mathongo

**Q1** (1) // mathongo // **Q2** (4) // mathongo // **Q3** (3) // mathongo // **Q4** (9) // mathongo

**Q5** (3) // mathongo // **Q6** (1) // mathongo // **Q7** (4) // mathongo // **Q8** (18) // mathongo

**Q9** (4) // mathongo // **Q10** (2) // mathongo // **Q11** (2) // mathongo // **Q12** (2) // mathongo

**Q13** (4) // mathongo // **Q14** (50) // mathongo // **Q15** (2) // mathongo // **Q16** (2) // mathongo

**Q17** (1) // mathongo // **Q18** (3) // mathongo // **Q19** (3) // mathongo // **Q20** (0) // mathongo

**Q21** (5) // mathongo // **Q22** (2) // mathongo // **Q23** (4) // mathongo // **Q24** (3) // mathongo

**Q25** (32) // mathongo // **Q26** (3) // mathongo // **Q27** (2) // mathongo // **Q28** (2) // mathongo

**Q29** (2) // mathongo // **Q30** (1) // mathongo // **Q31** (1) // mathongo // **Q32** (1) // mathongo

**Q33** (4) // mathongo // **Q34** (1) // mathongo // **Q35** (1) // mathongo // **Q36** (4) // mathongo

**Q37** (4) // mathongo // **Q38** (4) // mathongo // **Q39** (15) // mathongo // mathongo // mathongo

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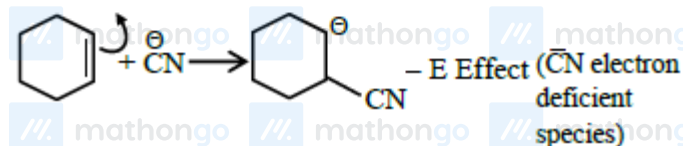
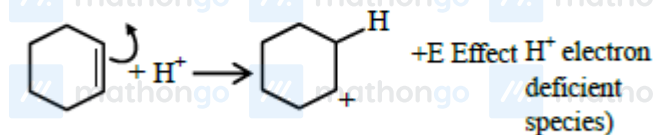
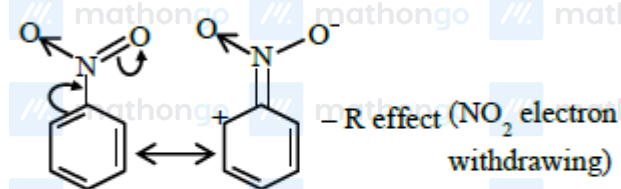
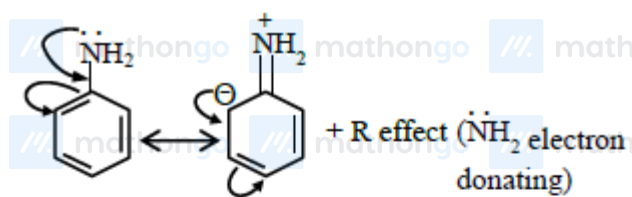
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## Solutions

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Q1



Q2

Hydrazine ( $\text{NH}_2 - \text{NH}_2$ ) have no carbon so does not show Lassaigne's test.

Q3

Hydrogen ion ( $\text{H}^+$ ) shows positive electromeric effect.

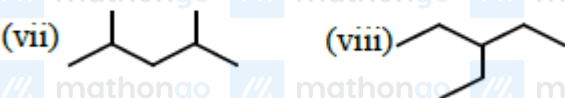
Q4

Do you want to practice these PYQs along with PYQs of JEE Main from 2002 till 2024?

[Click here to download MARKS App](#)

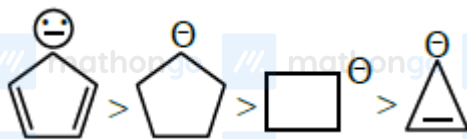
## Solutions

MathonGo

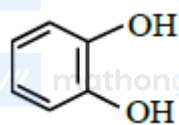


Q5

As we know compound (d) is aromatic and the compound (a) is anti-aromatic. Hence compound (d) is most stable and compound (a) is least stable among these in compound (b) and (c) carbon atom of that positive charge is  $sp^3$  hybridised they on the basis of angle strain theory compound (c) is more stable than compound (b).



Q6



IUPAC name : Benzene-1,2-diol Common name: catechol

Q7

The most common polar and acidic support used in adsorption chromatography is silica. The surface silanol groups on their supported to adsorb polar compound and work particularly well for basic substances. Alumina is the example of polar and basic adsorbent that is used in adsorption chromatography.

Q8

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## Solutions

MathonGo

Number of  $\sigma$ -bonds = 14Number of  $\pi$ -bonds = 4 $\equiv$  18

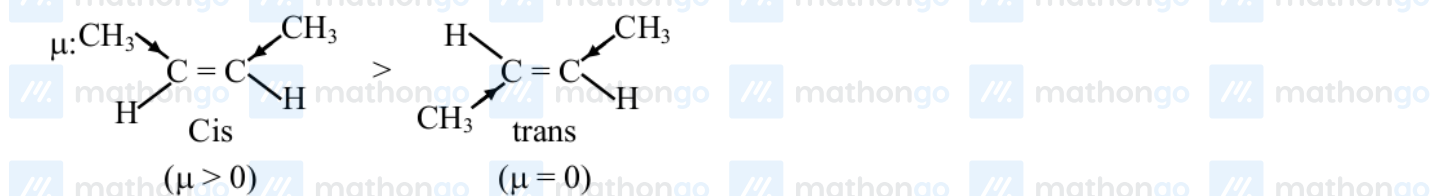
Q9

it has 5 $\sigma$  bonds and 1 $\pi$  bond.

Q10

Dipole moment is a vector quantity and for compound net dipole moment is the vector sum of all dipoles

hence dipole moment of cis form is greater than trans form.



Q11

Compounds having same number of carbon atoms follow the boiling point order as:

 $(\text{Boiling point})_{\text{Hydrogen bonding}} > (\text{Boiling point})_{\text{high polarity}} >$ 
 $(\text{Boiling point})_{\text{low polarity}} > (\text{Boiling point})_{\text{non polar}}$ 

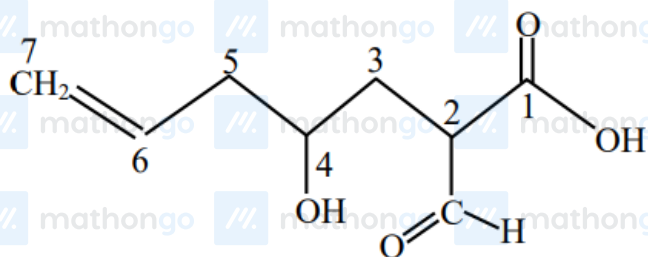
Q12

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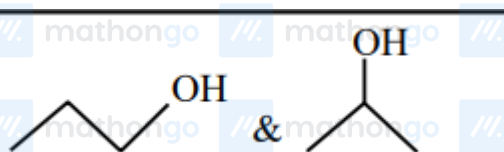
## Solutions

MathonGo

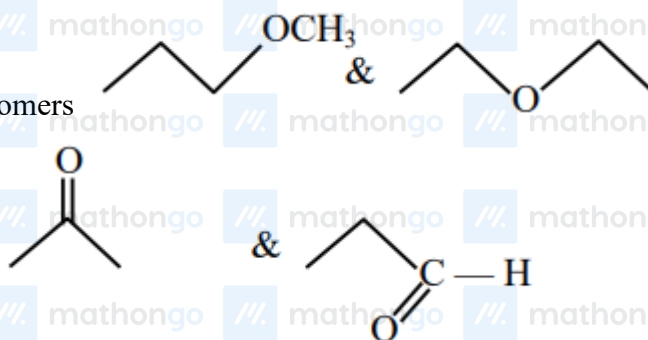


2-formyl-4-hydroxyhept-6-enoic acid

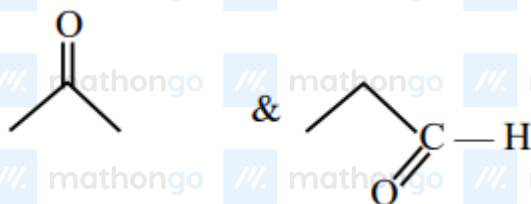
Q13



⇒ Position isomers



⇒ Metamers



⇒ Functional isomers

⇒ Chain isomers



Q14

$$R_f \text{ of A} = \frac{5}{12.5} \quad R_f \text{ of C} = \frac{10}{12.5}$$

$$\text{Ratio} = \frac{R_{f(A)}}{R_{f(C)}} = \frac{1}{2} = 0.5 \text{ or } 50 \times 10^{-2}$$

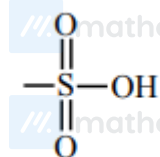
Q15

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## Solutions

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Group present in sulphonic acids

Q16

Option (B) is incorrect because aniline is immisible in water.

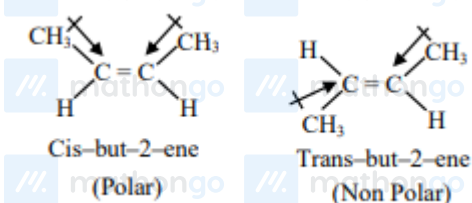
Q17

Metamer  $\Rightarrow$  Isomer having same molecular formula, same functional group but different alkyl/aryl groups on either side of functional group.

Q18

Non polar compounds are having higher value of  $R_f$  than polar compound.

Q19



Cis-but-2-ene has higher Dipole moment than trans-but-2-ene.

Q20

For 3d transition series; Oxidising power :  $V^{+5} < Cr^{+6} < Mn^{+7}$



Number of unpaired electron = 0

$$\mu = 0$$

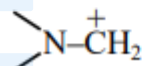
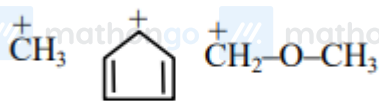
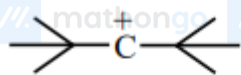
Q21

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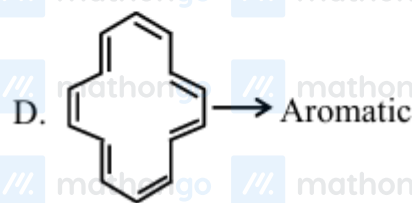
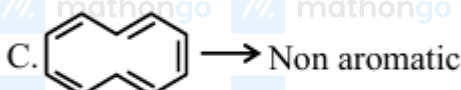
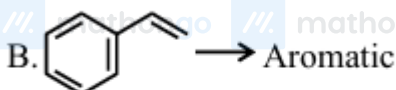
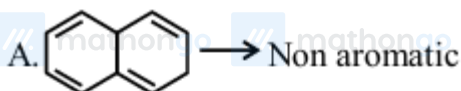
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## Solutions

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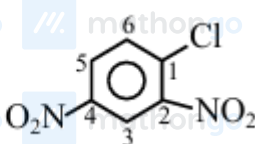


Q22



Q23

Statement I :



IUPAC name

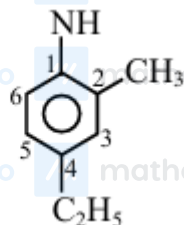
⇒ 1-chloro-2, 4-dinitrobenzene

⇒ statement-I is incorrect

⇒ 4-ethyl-2-methylaniline

⇒ statement-II is correct

Statement-II :



Q24

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## Solutions

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only one  $2^\circ$  carbon is present in this compound.

Q25



Total chiral centre = 5

No. of optical isomers =  $2^5 = 32$ .

Q26

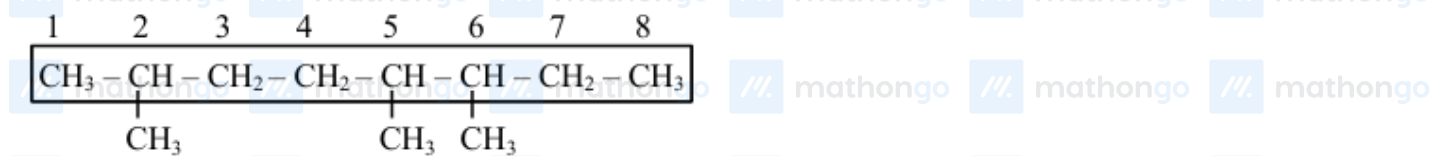
$\text{CH}_3\text{CH}_2\text{COOH}$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ ,  $\text{HCOOH}$

The correct order is :

$\text{HCOOH} > \text{CH}_3\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH} >$

$\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

Q27



2,5,6-Trimethyloctane

Q28

Nitrogen present in pyridine can not be estimated by Kjeldahl method as the nitrogen present in pyridine can not be easily converted into ammonium sulphate.

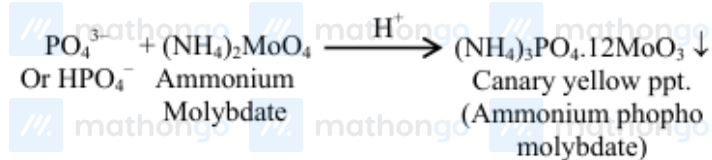
Q29

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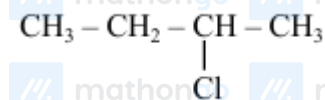
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## Solutions

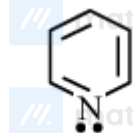
MathonGo



Q30



Q31



Q32

Organic compounds are purified based on their nature and impurity present in it.

Q33

Order of basic strength is

$\text{N}(\text{sp}^3, \text{localized lone pair}) > \text{N}(\text{sp}^2, \text{localized lone pair}) > \text{N}(\text{sp}^2, \text{delocalized lone pair, aromatic})$

$\therefore$  Piperidine  $>$  Pyridine  $>$  Pyrrole

Q34

Acidic strength order :-

$\text{B} > \text{D} > \text{C} > \text{A} > \text{E}$

Correct pKa Order :

$\text{B} < \text{D} < \text{C} < \text{A} < \text{E}$

Q35

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## Solutions

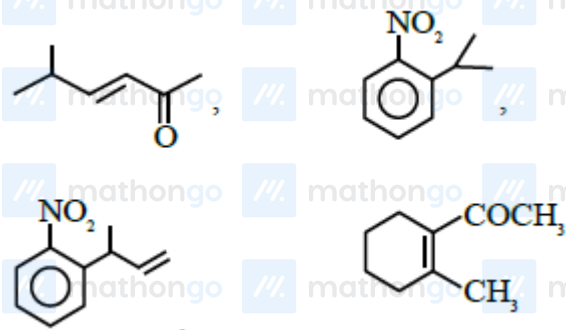
MathonGo

(1) Neutral structures are more stable than charged ones. Therefore I is more stable than II and III.

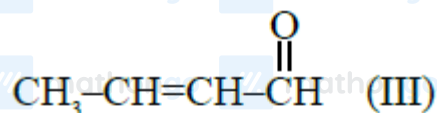
(2) +ve charge on less electronegative atom is more stable i.e.,  $C^{\oplus}$  is more stable than  $O^{\oplus}$  Order is  $I > III >$

III

Q36

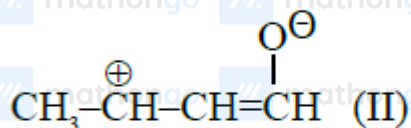


Q37

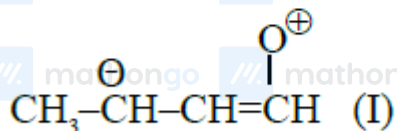


↓  
Non Polar R.S.

More No of covalent bond



↓  
Having -ve charge on more electronegative atom



↓  
Having -ve charge on less electronegative atom

Stability order  $III > II > I$

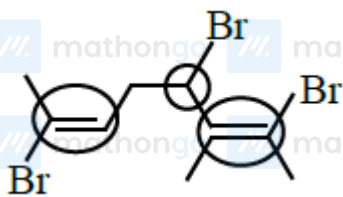
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## Solutions

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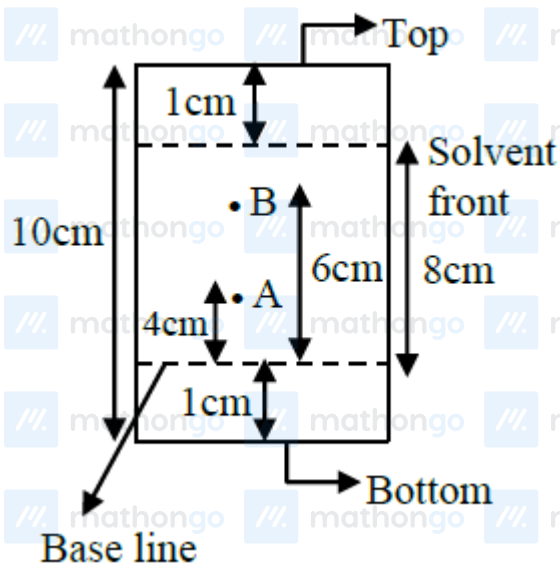
Q38



There are three stereo center So No of stereoisomer =  $2^3 = 8$

Q39

$$R_f = \frac{\text{Distance moved by substance from base line}}{\text{Distance moved by solvent from base line}}$$



$$(R_f)_A = \frac{4}{8} \quad (R_f)_B = \frac{6}{8}$$

$$\frac{(R_f)_B}{(R_f)_A} = \frac{6}{8} \times \frac{8}{4}$$

$$(R_f)_B = 1.5(R_f)_A$$

$$x = 15$$

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