NEET UG (2024)
Chemistry
Quiz-20

SECTION-A

51. Inductive effect involves:

(1) delocalization of σ– electrons

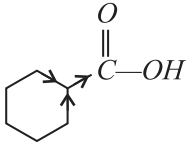
(2) delocalization of π– electrons

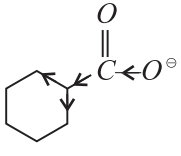
(3) displacement of σ– electrons

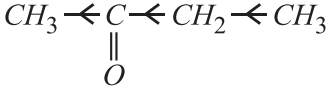
(4) displacement of π– electrons

52. Which of the following has incorrect direction of Inductive effect?

(1) 

(2) 

(3) 

(4) 

53. Which of the following alkyl group has the maximum +*I* effect?

(1) $(CH_3)_2CH-$ (2) $(CH_3)_3C-$

(3) CH_3CH_2- (4) CH_3-

54. Decreasing –I effect of given groups is :

(i) $-CN$ (ii) $-NO_2$

(iii) $-NH_2$ (iv) $-Cl$

(1) iii > ii > i > iv

(2) ii > iii > iv > i

(3) iii > ii > iv > i

(4) ii > i > iv > iii

55. Resonance effect involves:

(1) Delocalization of π– electrons along a conjugated system.

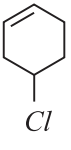
(2) Delocalization of lone pair along a conjugated system.

(3) Delocalization of negative charge along a conjugated system.

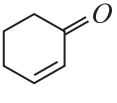
(4) All are correct.

56. Which of the following compound show resonance?

(1) 

(2) 

(3) 

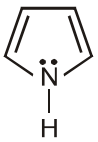
(4) 

57. In which compound delocalisation is not possible?

(1) 2-Butene
(2) 1, 3-Butadiene
(3) 1, 3, 5-Hexatriene
(4) Benzene

58. How many equally stable resonating structures are possible for  (tropylium cation)?

(1) 2 (2) 4
(3) 5 (4) 7

59. The hybridization of nitrogen in  (pyrrole) is:

(1) sp^3 (2) sp^2
(3) sp (4) Cann't be predicted

60. Heterolysis of a carbon-carbon bond gives:

(1) Carbanion
(2) Carbocation
(3) Both carbanion and carbocation
(4) Free radical

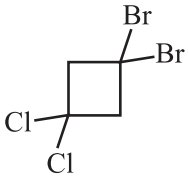
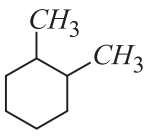
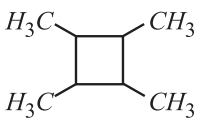
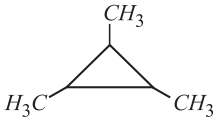
61. Which one is a 1° carbocation?

(1) $CH_3\overset{+}{C}H_2$ (2) $CH_3\overset{+}{C}HC_2H_5$
(3) $(CH_3)_2\overset{+}{C}H$ (4) $(CH_3)_3\overset{+}{C}$

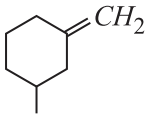
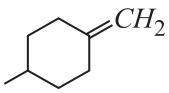
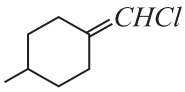
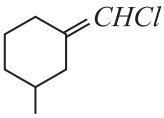
62. Stereoisomers have different:

(1) Molecular formula
(2) Structural formula
(3) Configuration
(4) Molecular mass

63. Which of the following compound cannot show geometrical isomerism?

(1) 
(2) 
(3) 
(4) 

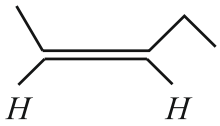
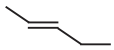
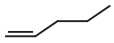
64. The geometrical isomerism is shown by: -

(1) 
(2) 
(3) 
(4) 

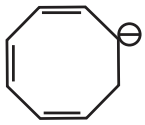
65. The number of sp^2 hybridised carbon in one benzene is

(1) 4 (2) 5
(3) 6 (4) 3

66. Identify (*Z*)-2-pentene:

(1) 
(2) 
(3) 
(4) 

67. In the given anion, –ve charge is delocalized on

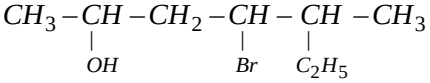


(1) One atom
(2) Three atom
(3) Four atom
(4) Five atom

68. Chiral molecules are:

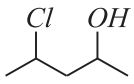
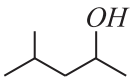
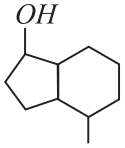
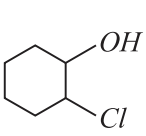
(1) Superimposable on their mirror image
(2) Not superimposable on their mirror image
(3) unstable molecules
(4) capable of showing geometrical isomerism

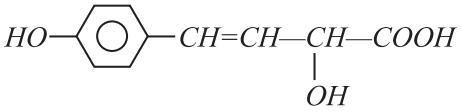
69. Number of chiral carbon present in the following compound:



(1) 2 (2) 3
(3) 4 (4) 5

70. The compound which has maximum number of chiral centres is

(1) 
(2) 
(3) 
(4) 

71.  will show:

(1) Geometrical isomerism only
(2) Optical isomerism only
(3) Geometrical and optical isomerism
(4) Neither geometrical nor optical isomerism

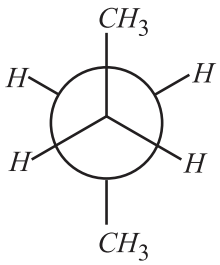
72. Which statement is FALSE:

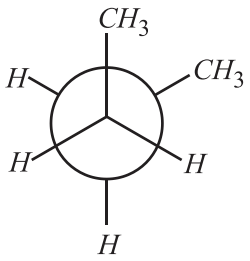
(1) When value of dihedral angle is 180º then this conformation is called anti conformation.
(2) When ϕ = 60º then this conformation is called gauche.
(3) When ϕ = 0º then this conformation is called eclipsed conformation.
(4) Other than staggered and eclipsed conformation are called gauche conformations.

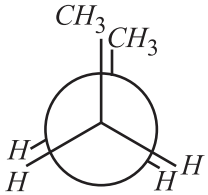
73. The eclipsed and staggered conformation of ethane is due to –

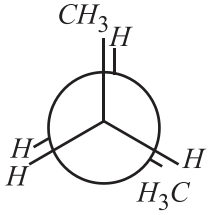
(1) Free rotation about *C–C* single bond
(2) Restricted rotation about *C–C* single bond
(3) Absence of rotation about *C–C* bond
(4) None of the above

74. In the following the most stable conformation of *n*-butane is:

(1) 

(2) 

(3) 

(4) 

75. In 2-Fluoroethanol, which conformer will be most stable?

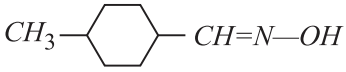
(1) Eclipsed
(2) Skew
(3) Gauche
(4) Staggered

76. How many geometrical isomers are possible for the given compound?

Ph – *CH* = *CH* – *CH* = *CH* – *COOH*

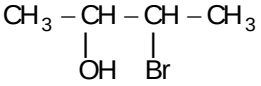
(1) 3 (2) 4
(3) 2 (4) 1

77. How many geometrical isomers are possible for the given compound?

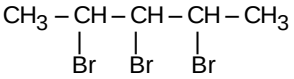


(1) 2 (2) 4
(3) 6 (4) 8

78. Total number of stereoisomers of compound is:



(1) 2 (2) 4
(3) 6 (4) 8

79. 

Total number of stereoisomers of the above compound are:

(1) 6 (2) 4
(3) 8 (4) 16

80. The total number of isomers for C_4H_8 are:

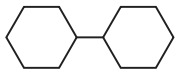
(1) 5 (2) 6
(3) 7 (4) 8

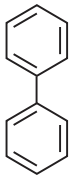
81. **Assertion:** Meso tartaric acid is optically inactive.

Reason: Because it has plane of symmetry.

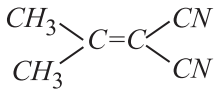
(1) If both assertion and reason are true and reason is the correct explanation of assertion.
(2) If both assertion and reason are true but reason is not the correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If both assertion and reason are false.

82. In which of the following molecules, all atoms are coplanar?

(1) 

(2) 

(3) 

(4) 

83. Racemic mixture is formed by mixing two:

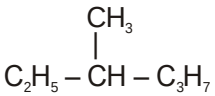
(1) Isomeric compounds

(2) Chiral compounds

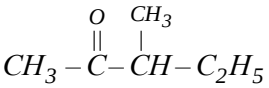
(3) Meso compounds

(4) Optical isomers

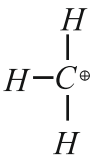
84. Among the following four structures I to IV,



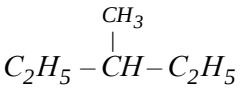
(I)



(II)



(III)



(IV)

it is true that

(1) All four are chiral compounds

(2) Only I and II are chiral compounds

(3) Only III is a chiral compound

(4) Only II and IV are chiral compounds

85. Which type of isomerism is shown by 2, 3-dichlorobutane?

(1) diastereomerism

(2) optical isomerism

(3) geometric isomerism

(4) structural isomerism

SECTION-B

86. Increasing order of stability among the three main conformations (i.e., eclipse, anti, gauche) of 2-fluoroethanol is

(1) eclipse, gauche, anti

(2) gauche, eclipse, anti

(3) eclipse, anti, gauche

(4) anti, gauche, eclipse

87. The number of stereoisomers possible for a compound of the molecular formula $CH_3–CH = CH–CH(OH)–Me$ is:

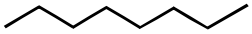
(1) 2

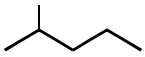
(2) 4

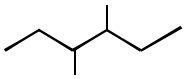
(3) 6

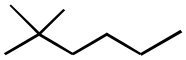
(4) 3

88. Which compound is not the isomer of 3-Ethyl-2-methylpentane?

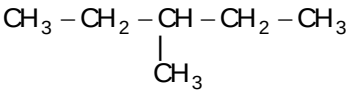
(1) 

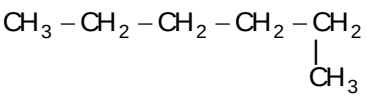
(2) 

(3) 

(4) 

89. What is the correct relationship between the following compounds?





(1) Chain isomers

(2) Position isomers

(3) Functional isomers

(4) Identical

90. What is the relation between 3-Ethylpentane and 3-Methylhexane?

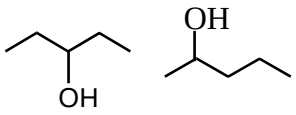
(1) Chain isomers

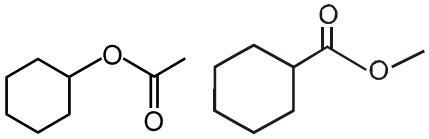
(2) Position isomers

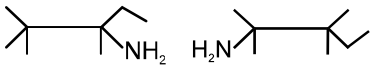
(3) Functional isomers

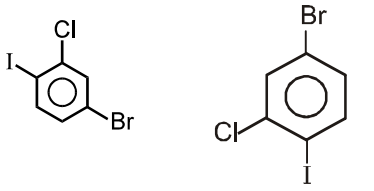
(4) No relation

91. Which of the following is a pair of metamers?

(1) 

(2) 

(3) 

(4) 

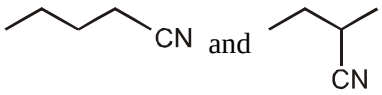
92. A position isomer of 2-pentanone is:

(1) 3-Pentanone
(2) 3-Methyl-2-butanone
(3) 1-Pentanal
(4) 2,2-Dimethylpropanal

93. *o*-Cresol and benzyl alcohol are:

(1) Functional isomers
(2) Position isomers
(3) Chain isomers
(4) All of the above

94. Identify the relationship between the given compounds.



(1) Chain isomers (2) Functional isomers
(3) Homologs (4) Position isomers

95. How many positional isomers are possible for dimethylcyclohexane?

(1) 3
(2) 4
(3) 5
(4) 6

96. How many isomers of $C_5H_{11}OH$ will be primary alcohols?

(1) Four (2) Five
(3) Three (4) Two

97. How many structural isomers could be obtained from the alkane C_6H_{14}?

(1) Four (2) Five
(3) Six (4) Seven

98. **Assertion:** Butane and 2-Methyl butane cannot be chain isomers.

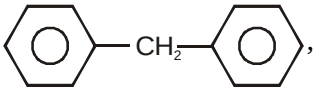
Reason: Butane is a straight chain alkane while 2-Methyl butane is a branched chain alkane.

(1) If both **assertion** and **reason** are **true** and reason is the **correct** explanation of assertion.
(2) If both **assertion** and **reason** are **true** but **reason** is not the **correct** explanation of **assertion**.
(3) If **Assertion** is **true** but reason is **false**.
(4) If both **assertion** and **reason** are **false**.

99. **Assertion:** Alkanes containing more than 3 carbon atoms can exhibit chain isomerism.

Reason: All the carbon atoms in alkanes are sp^3 hybridized.

(1) If both **assertion** and **reason** are **true** and reason is the **correct** explanation of assertion.
(2) If both **assertion** and **reason** are **true** but **reason** is not the **correct** explanation of **assertion**.
(3) If **Assertion** is **true** but reason is **false**.
(4) If both **assertion** and **reason** are **false**.

100. The molecular formula of diphenyl methane, 

, is $C_{13}H_{12}$.

How many structural isomers are possible when one of the hydrogen atom is replaced by chlorine atom?

(1) 4 (2) 8
(3) 7 (4) 6

Solution

51. (3)

Inductive effect involves displacement of σ - electrons.

[New NCERT Class 11th Page No.-352]

52. (4)

$-\overset{\overset{O}{\|}}{C}-$ shows $-I$ effect, so correct direction of I effect is $CH_3 \leftarrow C(=O) \leftarrow CH_2 \leftarrow CH_3$

[New NCERT Class 11th Page No.- 352]

53. (2)

Order of $+I$ is:

$(CH_3)_3C - > (CH_3)_2CH - > CH_3CH_2 - > - CH_3$

[New NCERT Class 11th Page No.- 352]

54. (4)

$-NO_2 > -CN > -Cl > -NH_2$

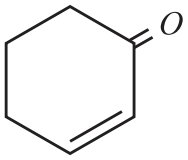
[New NCERT Class 11th Page No.- 352]

55. (4)

This is fact.

[New NCERT Class 11th Page No.-353]

56. (4)



Can show resonance due to π - π conjugation.

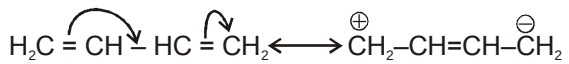
[New NCERT Class 11th Page No.- 353]

57. (1)

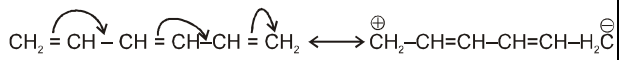
(1)

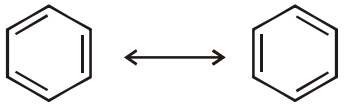
$CH_3 - CH = CH - CH_3$: only hyper conjugation

(2)



(3)



(4) 

[New NCERT Class 11th Page No.- 353]

58. (4)

7 including the given structure in which every C will receive a positive charge.

[New NCERT Class 11th Page No.- 353]

59. (2)

Here the lone pair present over nitrogen atom is involved in conjugation thus it is sp^2 hybridized.

[New NCERT Class 11th Page No.-354]

60. (3)

Heterolysis of Carbon bond gives Carbanion and Carbocation.

[New NCERT Class 11th Page No.-352]

61. (1)

(1) $CH_3\overset{+}{C}H_2$: 1° carbocation

(2) $CH_3\overset{+}{C}HC_2H_5$: 2° carbocation

(3) $(CH_3)_2\overset{+}{C}H$: 2° carbocation

(4) $(CH_3)_3\overset{+}{C}$: 3° carbocation

[New NCERT Class 11th Page No.-349]

62. (3)

Stereoisomers have same connectivity of atoms but different orientations (configurations) in space.

[New NCERT Class 12th Page No.-175]

63. (1)

Follow conditions of geometrical isomerism.

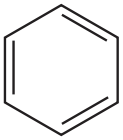
[New NCERT Class 11th Page No.-308]

64. (4)

Follow conditions of geometrical isomerism.

[New NCERT Class 11th Page No.-308]

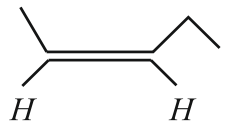
65. (3)



All carbon atoms are sp^2 hybridised.

[New NCERT Class 11th Page No.-340]

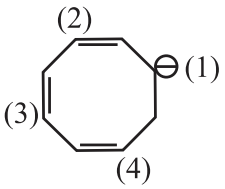
66. (1)



[Senior groups at same side of restricted rotation]

[New NCERT Class 11th Page No.-308]

67. (3)



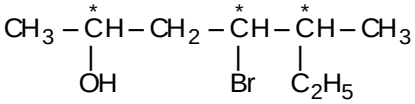
[New NCERT Class 11th Page No.-352]

68. (2)

Chiral molecules are not superimposable on their mirror image.

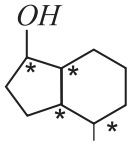
[New NCERT Class 12th Page No.-177]

69. (2)

 has three chiral carbon atoms.

[New NCERT Class 12th Page No.-177]

70. (3)

 Four chiral carbon atoms

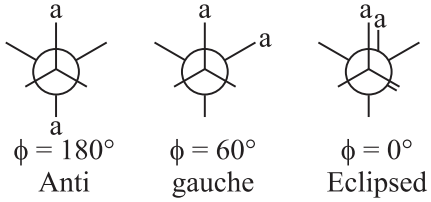
[New NCERT Class 12th Page No.-176]

71. (3)

Due to presence of $C = C$ and chiral carbon atom, it will show geometrical and optical isomerism both.

[New NCERT Class 11th Page No.-308]

72. (4)



[New NCERT Class 11th Page No.-305]

73. (1)

The eclipsed and staggered conformation of ethane is due to free rotation about C — C single bond.

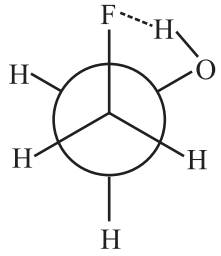
[New NCERT Class 11th Page No.-305]

74. (1)

Anti form of butane is more stable because of less strain.

[NCERT Class 11th Page No.-305]

75. (3)



Although steric repulsion exist but hydrogen bonding as shown above, gives stability to the gauche form.

[New NCERT Class 11th Page No.-306]

76. (2)

Unsymmetrical compound with 2 stereocentres has 4 geometrical isomers ($2^2 = 4$).

[New NCERT Class 11th Page No.-308]

77. (2)

Unsymmetrical compound with 2 stereocentres has 4 geometrical isomers.

[New NCERT Class 12th Page No.-175]

78. (2)

Unsymmetrical compound with 2 chiral centres has $2^2 = 4$ stereoisomers.

[New NCERT Class 12th Page No.-175]

79. (2)

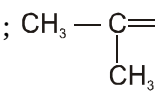
Symmetrical compound with three chiral centres has $2^{n-1} = 2^{3-1} = 4$ stereoisomers.

[New NCERT Class 12th Page No.-175]

80. (2)

C_4H_8 ($D.U.$ = 1) ; Total isomers = 6

$H_3C–H_2C–CH=CH_2$; $CH_3–CH=CH–CH_3$

(cis/trans.) ;  ;  ; 

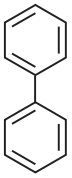
[New NCERT Class 11th Page No.-176]

81. (1)

Meso-tartaric acid is optically inactive and it has plane of symmetry.

[New NCERT Class 12th Page No.-176]

82. (2)



Biphenyl

All carbon atoms are sp^2 hybridized and its geometry is trigonal planar.

[New NCERT Class 11th Page No.-339]

83. (4)

An equimolar mixture of two i.e., dextro and laevorotatory optical isomers is termed as racemic mixture or *dl*- form or (±)- mixture.

[New NCERT Class 11th Page No.-348]

84. (2)

A chiral object or compound can be defined as the one that is not superimposable on its mirror image, or we can say that all the four groups attached to carbon atom must be different. only *I* and *II* are chiral compounds.

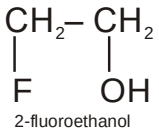
[New NCERT Class 12th Page No.-175]

85. (2)

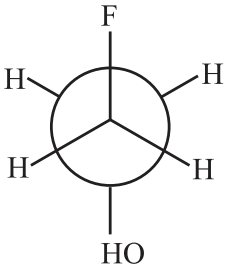
Due to presence of two asymmetric carbon atoms in 2, 3-dichlorobutane, $CH_3 - \underset{Cl}{CH} - \underset{Cl}{CH} - CH_3$

[New NCERT Class 12th Page No.-176]

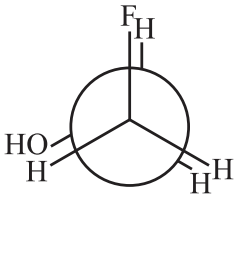
86. (3)



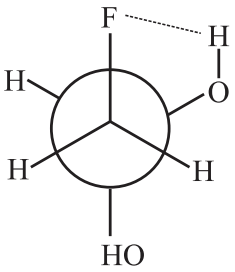
2-fluoroethanol



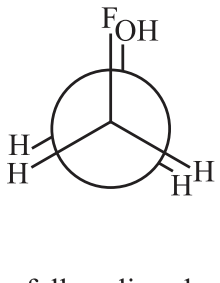
anti or staggered



eclipsed



skew or Gauche

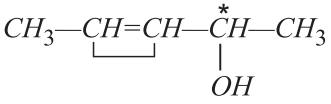


fully eclipsed

Gauche form is more stable due to intramolecular H-bonding.

[New NCERT Class 11th Page No.-306]

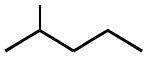
87. (2)



Total possible isomers are four.

[New NCERT Class 12th Page No.-176]

88. (2)



It has only six carbon atoms.

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89. (1)

Carbon skeleton is different in both compounds.

[New NCERT Class 11th Page No.-348]

90. (1)

Both are chain Isomer.

[New NCERT Class 11th Page No.-348]

91. (2)

Different *C* skeleton across the ester functional group.

[New NCERT Class 11th Page No.-349]

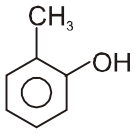
92. (1)

Different position of *C=O* group.

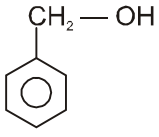
[New NCERT Class 11th Page No.-348]

93. (1)

o-Cresol and benzyl alcohol are functional isomers.



o – cresol



Benzyl alcohol

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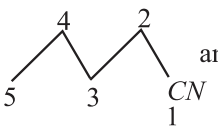
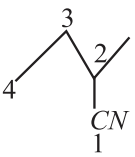
94. (1)



and



are chain Isomer.

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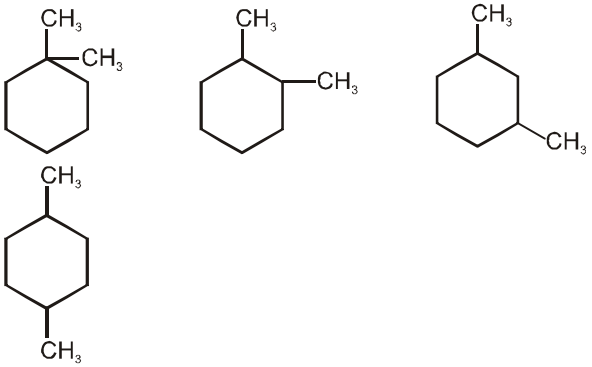
95. (2)



[New NCERT Class 11th Page No.-348]

96. (1)

(i) $CH_3CH_2CH_2CH_2CH_2OH$

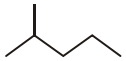
(ii) $(CH_3)_2–CH–CH_2–CH_2–OH$

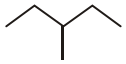
(iii) $(CH_3)_3C–CH_2–OH$

(iv) $CH_3–CH_2–CH(CH_3)CH_2–OH$

[New NCERT Class 11th Page No.-348]

97. (2)

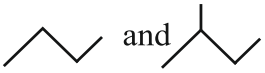
(i)  (ii) 

(iii)  (iv) 

(v) 

[New NCERT Class 11th Page No.-348]

98. (2)



are not chain isomer because molecular formula is different.

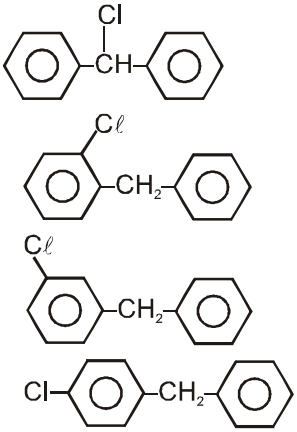
[New NCERT Class 11th Page No.-348]

99. (2)

Both **assertion** and **reason** are **true** but **reason** is not the **correct** explanation of **assertion**.

[New NCERT Class 11th Page No.-348]

100. (1)



Total 4-isomers.

[New NCERT Class 11th Page No.-348]