## Delight classes

## GOC-2

$1 \quad$ Which of the following is an electrophilic reagent?
(1) $R \ddot{O} H$
(2) $B F_{3}$
(3) $\mathrm{NH}_{3}$
(4) RO

2 Most unstable resonating structure is
(1)

(2)

(3)

(4) All are equally stable

3 Correct statement is:
(1) Resonance stabilizes molecule
(2) Resonance affects bond length
(3) Resonating structures are imaginary structures
(4) All

4 Which of the following is -M group when attached with benzene ring?
(1) -COOH
(2) $\mathrm{NH}_{3}$
(3) $-\mathrm{CCl}_{3}$
(4) All

5 Which of the following has hyper conjugation effect
(1)

(2)

(3)

(4) None of these

6 Which of the following is wrong representation
(1)

(2)

(3)

(4)


7 Which of the following pair of structure does not represent resonating structure
A)

B)

\&

C)

\&

(1) (A) \& (B)
(2) (B) \& (C)
(3) (A) \& (C)
(4) (A), (B) \& (C)

8 Arrange following in their basic strength order
I)

II)

III)

IV)

(1) IV $>$ III $>$ II $>$ I
(2) I $>$ II $>$ III $>$ IV,
(3) II $>$ I $>$ III $>$ IV
(4) II > I > IV >
$9 \quad$ Which of the following is most stable carbanion
(1)

(2)

(3)

(4)


10 Arrange the following carbanion in decreasing order of stability
(A)

$$
\mathrm{CH}_{2}=\mathrm{CH}
$$

(B) $\mathrm{Ph}_{2}-\mathrm{C}_{\mathrm{C}}^{\mathrm{H}} 2$
(C) $\mathrm{CH}_{2}=\mathrm{CH}-\stackrel{\ominus}{\mathrm{C}} \mathrm{H}_{2}$
(D)

(1) A $>$ B $>$ C $>$ D
(2) D $>\mathrm{B}>\mathrm{A}>\mathrm{C}$
(3) D $>$ B $>$ C $>$ A
(4) $\mathrm{B}>\mathrm{D}>\mathrm{C}>\mathrm{A}$

11 In which of the following ortho/para substitution by an electrophile is very facile
(1) Nitrobenzene
(2) Phenol
(3) Bezoic acid
(4) Acetophenone

12 The most stable resonating structure of $\mathrm{CH}_{3}-\ddot{\mathrm{O}}-\mathrm{CH}=\mathrm{CH}_{2}$
(1) $\mathrm{CH}_{3}-\mathrm{O}-\stackrel{\ominus}{\mathrm{C}} \mathrm{H}=\stackrel{\oplus}{\mathrm{C}}{ }_{2}$
(2) $\mathrm{CH}_{3}-\stackrel{\oplus}{\mathrm{O}}=\stackrel{\ominus}{\mathrm{C}} \mathrm{C}-\stackrel{\ominus}{\mathrm{C}} \mathrm{H}_{2}$
(3) $\mathrm{CH}_{3}-\mathrm{O}-\stackrel{\oplus}{\mathrm{C}} \mathrm{H}-\stackrel{\ominus}{\mathrm{CH}} \mathrm{H}_{2}$
(4) All are equally stable

13 Arrange the following radical in order of decreasing stability :-
A.

B.

C.

(1) $\mathrm{B}>\mathrm{A}>\mathrm{C}$
(2) A $>$ B $>$ C
(3) $\mathrm{C}>\mathrm{B}>\mathrm{A}$
(4) $\mathrm{C}>\mathrm{A}>\mathrm{B}$

14 Most stable carbocation is
1)

(2)

(3)

(4)


15 Which of the following shows the correct order of decreasing acidity
(1) $\mathrm{PhCO}_{2} \mathrm{H}>\mathrm{PhSO}_{3} \mathrm{H}>\mathrm{PhCH}_{2} \mathrm{OH}>\mathrm{PhOH}$
(2) $\mathrm{PhSO}_{3} \mathrm{H}>\mathrm{PhOH}>\mathrm{PhCOOH}>\mathrm{PhCH}_{2} \mathrm{OH}$
(3) $\mathrm{PhCO}_{2} \mathrm{H}>\mathrm{PhOH}>\mathrm{PhCH}_{2} \mathrm{OH}>\mathrm{PhSO}_{3} \mathrm{H}$
(4) $\mathrm{PhSO}_{3} \mathrm{H}>\mathrm{PhCOOH}>\mathrm{PhOH}>\mathrm{PhCH}_{2} \mathrm{OH}$

16 75. Which type of the overlap of orbitals involves in hyperconjugation?
(1) $\pi-\pi$
(2) $\sigma-\rho$
(3) $\sigma-\sigma$
(4) $\rho-\rho$

17 The geometry of a methyl carbanion is likely to be

1) Pyramidal
2) Tetrahedral
3) Planar
4) Linear

18 Conversion of propene to n -propyl bromide in presence of peroxide involves

1) free radical addition
2) nucleophilic substitution
3) free radical substitution
4) electrophilic addition

19 Decreasing(-I) power of given groups is :-
(A) -CN
(B) $-\mathrm{NO}_{2}$
(C) $-\mathrm{NH}_{2}$
(D) -F
(1) B $>$ A $>$ D $>$ C
(2) B $>$ C $>$ D $>$ A
(3) $\mathrm{C}>\mathrm{B}>\mathrm{D}>\mathrm{A}$
(4) $\mathrm{C}>\mathrm{B}>\mathrm{A}>\mathrm{D}$

20 Which of the following pairs is /are correctly matched ?
I) Carbocation : electrophile
II)Free radical : Paramagnetic
III)Carbene :Incomplete octet
IV)Carbanion: Incomplete octet

Select the correct answer using the codes given below

1) Only I
2) I and II
3) I, II, III and IV
4) I, II and III

21 Mark the true statement concerning mesomeric effect?

1) It occurs in conjugated compounds
2) It involves electrons in $\pi$ bonds
3) Here electron pair is transferred completely
4) All are true
$22 \beta$-elimination reaction leads to formation of
5) Carbene
6) $\pi$-bond
7) Sigma bond
8) Cyclic
compound

23
The reaction, $\left(\mathrm{CH}_{3}\right)_{3} \mathrm{C}-\mathrm{Br} \rightarrow\left(\mathrm{CH}_{3}\right)_{3} \mathrm{C}^{+}+\mathrm{Br}^{-}$is an example of

1) Homolytic fission
2) Heterolytic fission
3)Cracking
3) All the above

24 Which one of the compound behaves as an electrophile as well as nucleophile

1) Acetone
2) Cyanide ion
3 ) nitrite ion
3) Sulphite ion

25 Nucleophilic addition reaction will be most favoured in

1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2}-\mathrm{CO}-\mathrm{CH}_{3}$
2) $\mathrm{CH}_{3}-\mathrm{CO}-\mathrm{CH}_{3}$
3) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2}-\mathrm{CHO}$
4) $\mathrm{CH}_{3}-\mathrm{CHO}$

26 Which one of the following does not exhibit hyperconjugation?

1) Ethanal
2) Toluene
3) Isobutylene
4) Trifluro
acetaldehyde

27 Pick up the incorrect statement

1) Electromeric effect is a temporary effect
2) Inductive effect is transmitted over only quite a short length

3 ) -Cl is o.p-directing but moderately deactivating group
4) Inductive effect is a polarisability effect

28 What is hybridization of C in triplet carbine

1) SP
2) $S P^{2}$
3) $S P^{3}$
4) $S P$ or $S P^{2}$

29


Example of?

1) Free radical addition reaction
2) Free radical substitution reaction
3) nucleophilic substitution reaction
4) electrophilic substitution reaction

30 Which is stable Alkene

1) $\mathrm{CH}_{2}=\mathrm{CH}_{2}$
2) $\mathrm{CH}_{3}-\mathrm{CH}=\mathrm{CH}_{2}$

3) $\mathrm{CH}_{3}-\mathrm{CH}=\mathrm{CH}-\mathrm{CH}_{3}$
4) $H$

31 Which of the following is exhibit +I \& +M effect

1) $-\mathrm{NO}_{2}$
2) $-C F_{3}$
3) $-\mathrm{CH}_{3}$
4) $\mathrm{O}^{-}$

32 Which of the following compound has zero dipole moment

1) 1,1-Dichloro ethylene
2) cis-1,2-dichoroethylene
3) trans-1,2-dichoroethylene
4) Both $2 \& 3$

33 Optical inactivity of meso isomer is due to

1) element of asymmetry
2) internal compensation
3) due to lack of asymmetric carbon
4) External compensation

|  |  |
| :---: | :---: |
| 34 | Correct relation between the following two <br> 1) both are identical <br> 2) pair of enantiomers <br> 3) pair of diasteriomers <br> 4) pair of mesoisomers |
| 35 | An enentiomerically pure acid is treated with racemic mixture of an alcohol having chiral carbon, the ester formed will be <br> 1) mixture of diastereomers <br> 2) mixture of enantiomers <br> 3) meso compound <br> 4) racemic mixture |
| 36 | Which of the following is a false statement <br> 1) n-butanol and isobutanol are chain isomers <br> 2) n-propanol and isopropanol are position isomers <br> 3) 1-butene and Isobutene are position isomers <br> 4) Ethylene dichloride and Ethylidene chloride are positional isomers |
| 37 | HCN and HNC are <br> 1) Metamers <br> 2) Tautomers <br> 3) Positional isomers <br> 4) Chain isomers |
| 38 | Which of the following compounds will show metamerism <br> 1) $\mathrm{CH}_{3}-\mathrm{CO}-\mathrm{C}_{2} \mathrm{H}_{5}$ <br> 2) $\mathrm{C}_{2} \mathrm{H}_{5}-\mathrm{S}-\mathrm{C}_{2} \mathrm{H}_{5}$ <br> 3) $\mathrm{CH}_{3}-\mathrm{O}-\mathrm{CH}_{3}$ <br> 4) $\mathrm{CH}_{3}-\mathrm{O}-\mathrm{C}_{2} \mathrm{H}_{5}$ |
| 39 | 1) $\mathrm{S}, \mathrm{S}$ <br> 2) $R, R$ <br> 3) R, $S$ <br> 4) $S, R$ |


| 40 | Among the following compounds, one that will not show keto-enol tautomerism is |
| :--- | :--- |

1) 


2)

3)

4)


41 Maximum enolisation takes place in

1) $\mathrm{CH}_{3} \mathrm{COCH}_{3}$
2) $\mathrm{CH}_{3} \mathrm{COCH}_{3} \mathrm{CHO}$
3) $\mathrm{CH}_{3} \mathrm{COCH}_{2} \mathrm{COCH}_{3}$
4) 



42 Which is a pair of geometrical isomers
I.


III. ${ }_{\mathrm{Br}}^{\mathrm{Cl}}>\mathrm{C}=\mathrm{C}<_{\mathrm{H}}^{\mathrm{CH}_{3}}$


1) I and II
2) I and III
3) II and IV
4) III and IV

43 Which will show geometrical isomerism
1)

2)

3)

4) (1) and (3) both

44 Out of the following, the alkene that exhibits optical isomerism is

1) 3-methyl-2-pentene
2) 4-methyl-1-pentene
3) 3-methyl-1-pentene
4) 2-methyl-2-pentene

45 The molecular formula of diphenyl methane is $\mathrm{C}_{13} \mathrm{H}_{12}$.


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

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

46 Which of the following biphenyls is optically active


4)


47 How many structurally different dibromobenzenes are possible

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

48 Which functional group can be represented in compound having molecular formula $\mathrm{C}_{4} \mathrm{H}_{10} \mathrm{O}$

1) Aldehyde
2) Ketone
3) Acid
4) Alcohol

49 How many distinct terminal alkynes exist with a molecular formula $\mathrm{C}_{5} \mathrm{H}_{8}$

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

50 Including the given one, in total how many positional isomers are possible for


1) 6
2) 3
3) 4
4) 5
$51 \begin{array}{cc}\mathrm{CH}_{3}-\mathrm{CH}_{2}-\mathrm{CH}_{2}-\mathrm{CO}_{2} \mathrm{H} ; & \mathrm{CH}_{3}-\mathrm{CH}-\mathrm{CH}_{3} \\ \text { (A) } \\ & \text { (B) }{ }^{2} \\ & \\ & \mathrm{CO}_{2} \mathrm{H}\end{array}$
(A) and (B) are
5) Chain
6) Positional
7) Functional
8) Metamers

52


A; $(A)$ and $(B)$ are:
(A)
(B)

1) Chain isomers
2) Functional isomers
3) Metamers
4) Positional isomers

53 Total number of stereoisomer for 2,3-dichlorobutane are

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

54 How many cyclic structural isomers possible for $\mathrm{C}_{5} \mathrm{H}_{10}$

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

| 55 | What is the relationship between trans-2-butene and cis-2-butene |
| :--- | :--- |

1) unrelated compounds
2) constitutional isomers
3) enantiomers
4) diastereomers

56 Determine the double bond stereochemistry ( $\mathbf{E}$ or $\mathbf{Z}$ ) for the following molecules


A


B

1) $A: E ; B: E$
2) $A: Z ; B: Z$
3) $A: E ; B: Z$
4) $A: Z ; B: E$

57 i) $\mathrm{CH}_{2}=\mathrm{CH}-\mathrm{CH}_{2}-\mathrm{CH}=\mathrm{CH}_{2}$
ii) $\mathrm{CH}_{2}=\mathrm{CH}-\mathrm{CH}=\mathrm{CH}-\mathrm{CH}_{3}$
iii) $\mathrm{CH}_{3}-\mathrm{CH}=\mathrm{CH}-\mathrm{CH}=\mathrm{CH}-\mathrm{CH}_{3}$

The number of possible geometric isomers for the above compounds respectively are

1) $0,2,4$
2) $2,2,4$
3) $0,3,3$
4) $0,2,3$

58 How many stereoisomers are there for following structure


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

Sol: No. of stereo isomers $=2^{n}$ where $n=1$, which is $4^{\text {th }}$ carbon


How many chiral centers are present in above compound

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

60 Which of the following compounds is never chiral

1) 2,3-dibromobutane
2) 1,3-dibromobutane
3) 1,2-dichlorobutane
4) 1,4-dibromobutane

61 Which of the following groups has the highest priority using the Cahn, Ingold, Prelog rules


3) -OH
4) $-\mathrm{O}-\mathrm{CH}_{3}$
$62 \quad$ Which of the following is/are optically inactive

1) a 50-50 mixture of $R$ and $S$ enantiomers
2) a meso compound
3) every achiral compound
4) all of the above

63 A mixture of equal amounts of two enantiomers.

1) is called a racemic mixture

2 ) is optically inactive
3) implies that the enantiomers are meso forms
4) both 1 and 2

64 What is the relationship between the following compounds
 and


1) enantiomers
2) diastereomers
3) constitutional isomers
4) conformational isomers

65 Number of chain isomers possible for
$\mathrm{C}_{6} \mathrm{H}_{14}$ is

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

66 Primary, secondary and tertiary amines are

1) Chain isomers
2) Position isomers
3) Functional isomers
4) Tautomers

67 The number of structural isomers possible from the molecular formula $\mathrm{C}_{3} \mathrm{H}_{9} \mathrm{~N}$

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

68 The order or stability of the following tautomeric compound is



OH O


1) III $>$ II $>$ I
2) II $>$ I $>$ III
3) II $>$ III $>$ I
4) I $>$ II $>$ III

69 The total number of benzene derivatives having the molecular formula $\mathrm{C}_{7} \mathrm{H}_{8} \mathrm{O}$ is

1) 3
2) 4
3) 5
4) 6
$70 \quad$ The observed rotation of 2.0 gm of a compound in 10 ml of solution in polarimeter tube of $\mathbf{2 5} \mathrm{cm}$ long is $\boldsymbol{+ 1 3 . 4 ^ { 0 }}$. What is specific rotation of compound
5) +26.8
6) -26.8
7) +2.68
8) +53.6

71 Which structure represents
D- glyceraldehyde
1)

2)

3)

4)


72 Which one of the following is most stable carbocation?

2)

3)



73 On catalytic reduction $\left(\mathrm{H}_{2} / \mathrm{Pt}\right)$ how many alkenes will give 2- methyl butane?

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

74 The molecular structure of diphenylmethane is


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

1) 3
2) 4
3) 8
4) 7

75 The absolute configuration of the following compound is


1) $2 \mathrm{~S}, 3 \mathrm{R}$
2) $2 \mathrm{~S}, 3 \mathrm{~S}$
3) $2 \mathrm{R}, 3 \mathrm{~S}$
4) $2 R, 3 R$

76 Total number of stereoisomers of the compound 2,4-dichloroheptane are

1) 2
2) 3
3) 4
4) 6

77 Which of the following is correct set of physical properties of the geometrical isomers?



I
II

| Dipole moment | Boiling point | Melting point | Stability |
| :--- | :--- | :--- | :--- |
| 1) I $>$ II | I $>$ II | II $>$ I | I $>$ II |
| 2) II $>$ I | II $>$ I | II $>$ I | II $>$ I |
| 3$)$ I $>$ II | I $>$ II | I $>$ II | I $>$ II |
| 4$)$ II $>$ I | II $>$ I | I $>$ II | I $>$ II |

Identify number of chiral carbons in the following compounds
I.

II.

III.

IV.


1) $0,2,2,4$
2) $2,2,0,4$
3) $1,2,2,4$
4) 2, 2, 2, 4

79 Which of the following compound is isomeric with methyl vinyl ether?

1) Propanal
2) 1-propanol
3) Ethyl methyl ether
4) Ether
$\mathbf{8 0}$ What is the maximum number of stereoisomers that could exist for the compound below?

5) 6
6) 8
7) 10
8) 16

81 Types of geometrical isomerism shown at point $\mathrm{X}, \mathrm{Y}$ and Z of the following compound respectively are


X Y Z

1) cis cis trans
2) cis trans trans
3) trans cis cis
4) cis trans cis

82 The correct statement about compounds (P), (Q) and (R)

(P)

(Q)

(R)

1) $P$ and $Q$ are identical
2) $P$ and $Q$ are diastereomers
3) $P$ and $R$ enantiomers
4) $P$ and $Q$ are enantiomers

83 If optical rotation produced by

is $36^{\circ}$ then optical rotation produced by


1) $-36^{\circ}$
2) $0^{\circ}$
3) $+26^{\circ}$
4) Unpredictable

Compound is meso, so net rotation is $0^{\circ}$
84 How many chiral centers are present in cholesterol?

1) 7
2) 8
3) 9
4) 5

85 . Which of the following does not show tautomerism
1)


2)
4) All of these

86 Systematic IUPAC name of bond line structure given below


1) 3, 4-Dimethyl-2-buten-4-ol
2) 1, 2-Dimethyl-2-butenol
3) 3-Methylpent-3-en-2-ol
4) 3, 3-Dimethyl-1, 3-pentenol

87 Systematic IUPAC name of bond line structure given below


1) 3, 4-Dimethyl-2-buten-4-ol
2) 1, 2-Dimethyl-2-butenol
3) 3-Methylpent-3-en-2-ol
4) 3, 3-Dimethyl-1, 3-pentenol

88 How many structural isomers of alcohols with the formula $\mathrm{C}_{4} \mathrm{H}_{9} \mathrm{OH}$ are possible if all the carbon atoms are in straight chain?

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

89 The order of stability of compounds $\mathrm{X}, \mathrm{Y}$ and Z :


$Y$,

2) $Y>Z>X$

1) $X>Y>Z$
2) $X>Z>Y$

90 The order of reactivity of the following compounds


IV
towards electrophilic substitution will be:

|  | 1)I $>\mathrm{II}>\mathrm{III}>\mathrm{IV}$ | 2) $\mathrm{IV}>\mathrm{III}>\mathrm{II}>\mathrm{I}$ | 3) $\mathrm{II}>\mathrm{I}>\mathrm{III}>\mathrm{IV}$ | 4) III $>\mathrm{II}>\mathrm{I}>\mathrm{IV}$ |
| :--- | :--- | :--- | :--- | :--- |


| 1 | ANS-2 <br> Sol: Electron deficient molecules |
| :---: | :---: |
| 2 | ANS-1 <br> Sol: Resonance |
| 3 | ANS-4 <br> Sol: According to Resonance |
| 4 | ANS-4 <br> Sol: All are $-M$ effect group |
| 5 | ANS-3 <br> Sol: $\quad \alpha$ Hydrogens |
| 6 | ANS-3 <br> Sol: Electron pair is shift towards more electronegative atom |
| 7 | ANS-1 <br> Sol: Resonance sturucture are conjugation |
| 8 | ANS-2 <br> Sol: Basic nature of amions |
| 9 | ANS-4 <br> Sol: Strong $-M$ effect group at meta position |
| 10 | ANS-3 <br> Sol: According to order of stability of carbanion |
| 11 | ANS-2 <br> Sol: $\quad-M$ effect group |
| 12 | ANS-2 |


|  | Sol: Conjugation |
| :---: | :---: |
| 13 | ANS-4 <br> Sol: Allylic > Tertiary > secondary > Primary Alkyl free radicals |
| 14 | ANS-1 <br> Sol: Resonance |
| 15 | ANS-4 <br> Sol: Order of Acidic character is |
| 16 | ANS-2 <br> Sol: $-I$ effect |
| 17 | ANS-1 <br> Sol: Free bond pairs and one lone pair ( non bonded electrons) |
| 18 | ANS-1 <br> Sol: Antimarkownikov's rule |
| 19 | ANS-1 <br> Sol: Order of -1 effect is bond $-\mathrm{NO}_{2}>-\mathrm{CN}>-\mathrm{F}>-\mathrm{NH}_{2}$ |
| 20 | ANS-3 <br> Sol: Depending on the number of electrons |
| 21 | ANS-4 <br> Sol: According to definition of mesomeric effect |
| 22 | ANS-2 <br> Sol: $\quad \sigma$ is converted into $\pi$ bond by elimination reactions |
| 23 | ANS-2 <br> Sol: Fission of covalent bond |
| 24 | ANS-1 <br> Sol: Acetone contains both electron loving and electron donating groups |
| 25 | ANS-4 <br> Sol: $\quad+I$ effect |
| 26 | ANS-4 <br> Sol: Trifluroacetaldehyde has no $\alpha$ hydrogen |
| 27 | ANS-4 <br> Sol: Definition of inductive effect |
| 28 | ANS-4 <br> Sol: Hybridization of triplet carbene is $\mathrm{SP}^{2}$ or SP |


| 29 | ANS-2 <br> Sol: Allylic substitution |
| :---: | :---: |
| 30 | ANS-4 <br> Sol: Depending on the number of $\alpha \mathrm{CH}_{3}$ groups |
| 31 | ANS-4 <br> Sol: $\quad O^{-}$is +I and +M group |
| 32 | ANS-3 <br> Sol: Symmetrical trans isomers have no dipole moment |
| 33 | ANS-2 <br> Sol: optical rotation of one half of the molecule cancels that of other half due to plane of symmetry |
| 34 | ANS-3 <br> Sol: Not mirror images |
| 35 | ANS-1 <br> Sol: Let acid is ' d ' . It reacts with ' dl ' alcohol to form dd ester and dl ester. dd \& dl forms of esters are diastereomers.(Resolution of Racemic mixture ) |
| 36 | ANS-3 <br> Sol: 1-butene and isobutene are chain isomers |
| 37 | ANS-2 <br> Sol: They are differing in the position of ' H ' |
| 38 | ANS-2 <br> Sol: methyl propyl thioether \& diethyl thio ethers are metamers |
| 39 | ANS-2 <br> Sol: Absolute configuration of both chiral carbons—R\&R |
| 40 | ANS : 2 <br> Sol: $\alpha$-H is at bridge head carbon. But, it can not undergo $\mathrm{sp}^{2}$ hybridisation |
| 41 | ANS-4 <br> Sol: phenol is stabilized by aromatic nature |
| 42 | ANS-3 <br> Sol: II $\rightarrow \mathrm{Z}$ and IV $\rightarrow \mathrm{E}$ |
| 43 | Key : 4 <br> Sol: Double bonded carbons attached to different groups in $1 \& 3$ |
| 44 | ANS-3 <br> Sol: In 3- methyl-1 pentene $3^{\text {rd }}$ carbon is chiral |


| 45 | ANS-2 <br> Sol: Three monocloro derivatives are obtained by substituting chlorine atom at $2^{\text {nd }}, 3^{\text {rd }} \& 4^{\text {th }}$ position of one of the phenyl rings and fourth one is obtained by substituting on methylene group |
| :---: | :---: |
| 46 | Key : 3 <br> Sol: Biphenyls with unsymmetrical ortho substituents are optically active |
| 47 | ANS-3 <br> Sol: Ortho, meta, para |
| 48 | ANS-4 <br> Sol: $\mathrm{CnH}_{2 n+1} \mathrm{OH}$ is the general formula of alcohol |
| 49 | ANS-2 <br> Sol: n-pentyne, isopentyne |
| 50 | ANS-2 <br> Sol: 1) 1,2,3 trimethyl benzene <br> 2) $1,2,4$ trimethyl benzene <br> 3) $1,3,5$ trimethyl benzene |
| 51 | ANS-1 <br> Sol: A\&B differ in length of parent chain |
| 52 | ANS-2 <br> Sol: $\mathrm{A} \rightarrow$ ketone \& B $\rightarrow$ aldehyde |
| 53 | ANS-1 <br> Sol: For symmetrical molecules; total no of optical isomers $=2^{n-1}+2^{\frac{n}{2}-1}$ |
| 54 | ANS-2 <br> Sol: 1)Cyclopentane <br> 2) methyl cyclobutane <br> 3) ethyl cyclopropane <br> 4) 1,1-dimethyl cyclopropane <br> 5) 1,2-dimethyl cyclopropane |
| 55 | ANS-4 <br> Sol: not mirror increase |
| 56 | ANS-4 <br> Sol: A-Z \& B $\rightarrow$ E |
| 57 | ANS-4 <br> Sol: i $\rightarrow$ can't show GI; ii $\rightarrow$ one of the double bonded carbon atoms has similar groups iii) $=2^{n-1}+2^{\frac{n}{2}-1}$ |
| 58 | ANS-2 <br> Sol: No. of stereo isomers $=2^{n}$ where $n=1$, which is $4^{\text {th }}$ carbon |


|  |  |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: | :---: |
| $\mathbf{5 9}$ | ANS-3 |  |  |  |  |
| Sol: |  |  |  |  |  |


| 74 | ANS-2 <br> Sol: Substitution at $\mathrm{sp}^{3}$, and $\mathrm{sp}^{2}$ carbons. |
| :---: | :---: |
| 75 | ANS-2 <br> Sol: <br> (2S, 3S) <br> If $4^{\text {th }}$ group is on horizontal line then configuration become opposite. |
| 76 | ANS-3 <br> Sol: |
| 77 | ANS-4 <br> Sol: Trans isomers are symmetric with high melting point and stability. |
| 78 |  |
| 79 | ANS-1 <br> Sol: $\mathrm{CH}_{3}-\mathrm{O}-\mathrm{CH}=\mathrm{CH}_{2}$ <br> Methyl vinyl ether and <br> Propanal |
| 80 | ANS-3 <br> Sol: <br> Total stereoisomer $\quad=2^{n-1}+2^{\frac{n}{2}-1}$ |

$$
\begin{aligned}
& =2^{4-1}+2^{\frac{4}{2}-1} \\
& =2^{3}+2=10
\end{aligned}
$$

81 ANS-1


82 ANS-4
Sol:

(2S, 3R)
(2R, 3S)

(2R, 3R)

83 ANS-2
Sol:


Compound is meso, so net rotation is $0^{\circ}$

| 84 | ANS-2 <br> Sol: <br> Carbon bonded to four different atoms group of atoms is chairal |
| :---: | :---: |
| 85 | . ANS-4 <br> Sol: Unsaturated aldehydes or ketones having $\alpha$-hydrogen exhibit tautomerism |
| 86 | ANS-3 <br> Sol: -OH group should have top priority. |
| 87 | ANS-3 <br> Sol: -OH group should have top priority. |
| 88 | ANS-3 <br> Sol: |
| 89 | ANS-3 <br> Sol: $Z \Rightarrow$ Aromatic <br> $X \Rightarrow$ Non aromatic $Y \Rightarrow$ Anti aromatic |
| 90 | ANS-1 <br> Sol: |

