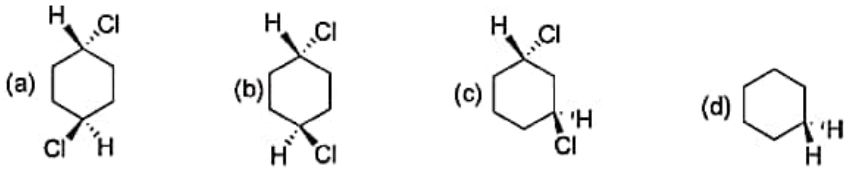
Stereochemistry - 2

1. What is the stereochemical relationship between the following compound?

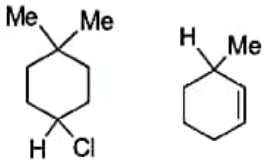
(a) Enantimers (b) Diastereomers
(c) Both are meso (d) Same compound

2. Which of the compound is optically active?



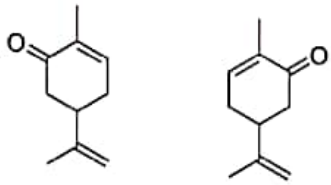
3. An example of an optically actively molecule is
(a) 2-methyl -1–propanol (b) 2-methyl -2-propanol
(c) 1-butanol (d) 1-butanol-1-D

4.



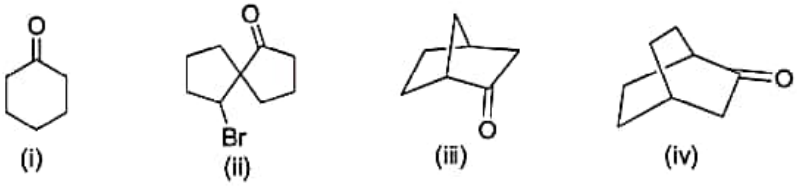
Select the correct statement.
(a) A is optically active, while B is optically inactive.
(b) B is optically active, while A is optically inactive.
(c) Both A and are optically inactive.
(d) Both A and are optically active.

5. The two compounds shown in the figure below are



(a) diastereomers (b) enantiomers (c) epimers (d) regioisomers

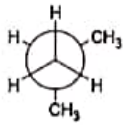
6. Which of the following compounds is optically active?



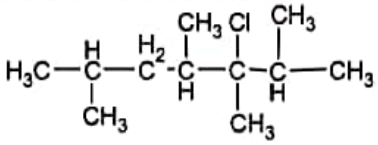
(i) (ii) (iii) (iv)

(a) I (b) ii (c) iii (d) iv

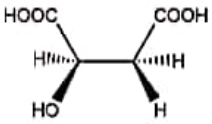
7. In erythro-2,3-dihydroxy butanoic acid, if the methyl group is replaced by a carboxyl group, the result is.
   (a) dl-tartaric acid (b) d-tartaric acid (c) l- tartaric acid (d) meso- tartaric acid
8. Which of the following cannot be optically active?
   (a) 2-hydroxypropanoic acid (b) 2-hydroxybutanedoic acid
   (c) 3-hydroxypropanoic acid (d) 2,3-hydroxybutanedoic acid
9. The newman projection below represents

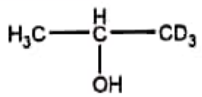


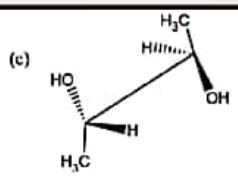
   (a) A stage from of 2-methyl propane
   (b) A gauche form of butane
   (c) An eclipsed form a 2-methyl propane
   (d) A most stable conformation of 2-methyl butane
10. How many stereoisomers are there for molecule drawn?

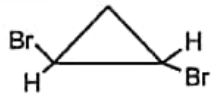


   (a) Two (b) Four (c) Six (d) Eight
11. Choose the correct configuration in E-1-bromo-1-chloropropane.
   (a) H and Br on opposite site of the double bond
   (b) $-CH_3$ and Cl are on the same side of the double bond
   (c) H and Cl are on same side of the double bond
   (d) $-CH_3$ and Cl are on opposite side
12. Choose the correct order of the stability of the different conformations of cyclohexane
   (a) Chair form > Boat form > Twist boat form
   (b) Boat form > Twist boat form > Chair form
   (c) Chair form > Twist boat form > Boat form
   (d) Twist boat form > Boat form > Chair form
13. Which of the following molecules will not show optical activity?

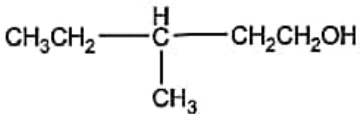
(a) 

(b) 

(c) 

(d) 

14. In 3-methyl pentane -1-ol



The priority sequence for R and S notations is

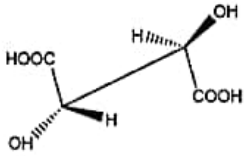
(a) $CH_3CH_2OH > CH_3CH_2 > CH_3 > H$ (b) $CH_3CH_2 > CH_2CH_2OH > CH_3 > H$

(c) $CH_3 > CH_3CH_2 > CH_2CH_2OH > H$ (d) $H > CH_3 > CH_3CH_2 > CH_2CH_2OH$

15. The dihedral angel between C – H (as viewed along the carbon-carbon bond axis) in a staggered from of ethane is

(a) 240° (b) 180° (c) 120° (d) 60°

16. The structural representation of tartaric acid as show here has



(a) A plane of symmetry (b) a center of symmetry

(c) no symmetry (d) None of these

17. The preferred conformation of trans-l, 4 dimethylcyclohexane has the cyclohexane ring in the

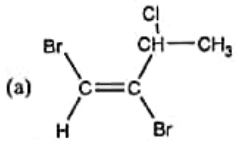
(a) chair form with both methyl groups in the equatorial positions

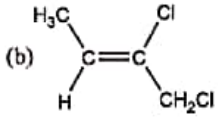
(b) chair form with both methyl groups in the axial positions

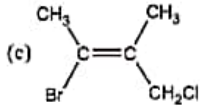
(c) chair form with one methyl group in the axial and the other in the equatorial position

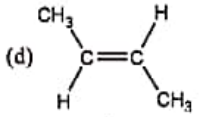
(d) boat form with the methyl group in the flag poles.

18. The one which will show optical isomerism is

(a) 

(b) 

(c) 

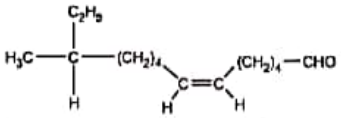
(d) 

19. Which of the following compound contains diastereotropic protons?

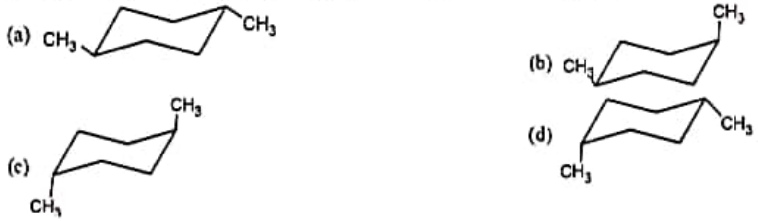
(a) Ethyl chloride (b) 1,2-dichloropropane

(c) 2-methyl propane (d) 1,2-dichloroethane

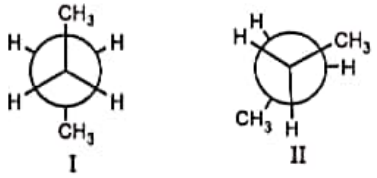
20. The reaction of erythro 1-bromo 1, 2-diphenyl propane with alcoholic KOH gives.
    (a) (Z)-1, 2-diphenyl- 1-propane (b) (E)-1, 2-diphenyl- 1-propane
    (c) both (Z) and (E)-1, 2-diphenyl- 1-propane (d) 1, 2-diphenyl- 1-propane
21. The proper designation for the chiral centre and the geometrical configuration of this molecule would be



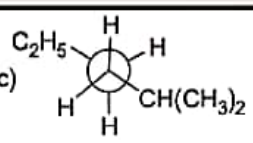
    (a) R and Z (b) R and E (c) S and trans (d) S and Z
22. Which of the following is resolvable into enantiomers?
    (a) Trans 1, 3-cyclohexane diol (b) Trans 1,4-cyclohexane diol
    (c) Cis-1,2-cyclohexane diol (d) Cis-1,4-cyclohexane diol
23. The most stable conformation of 1,4-dimethyl-cyclohexane

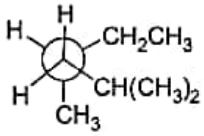


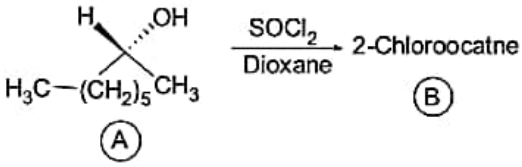
24. Addition of bromine to cis-2- butene yields
    (a) meso-2, 3-dibromobutane (b) racemic 2,3-dibromobutane
    (c) d-2, 3-dibromobutane (d) l-2, 3-dibromobutane
25. Which of the following is best explanation for relative stabilities of the conformations?



    (a) I has more torsional strain (b) II has more torsional strain
    (c) I has more steric strain (d) both have more steric strain
26. Which of the following represent the lowest energy conformer of 2-methylhexane considering the rotation about C-3, C-4?

(c) 

(d) 

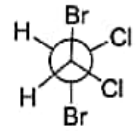
27. 

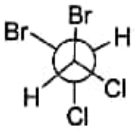
The statement that is true about the reaction is

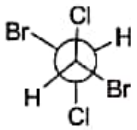
(a) A and B are both R-isomers (b) A and B are both S-isomers

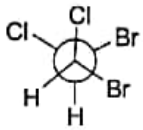
(c) A is R-isomer and B is S-isomer (d) A is S-isomer and B is R-isomer

28. The most stable conformer of meso-1, 2 –dibromo -1, 2-dichloro ethane is

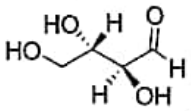
(a) 

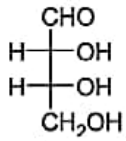
(b) 

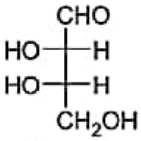
(c) 

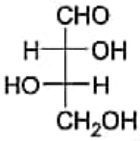
(d) 

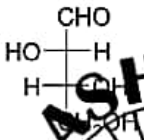
29. Which of the fischer projection formula correspond to the following stereo structure?



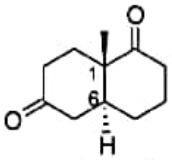
(a) 

(b) 

(c) 

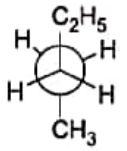
(d) 

30. The configuration (R, S-rotation) at C-1 and C-6 of the compound below are

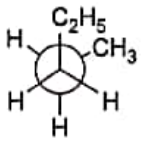


(a) 1S, 6S (b) 1S, 6R (c) 1R, 6S (d) 1R, 6S

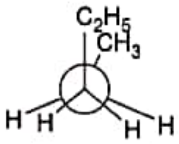
31. The most stale conformation of n-pentane is



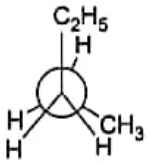
I



II



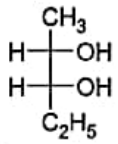
III

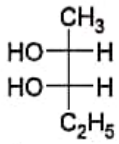


IV

(a) I (b) II (c) III (d) IV

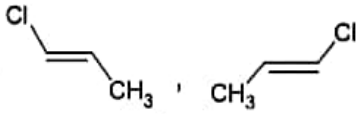
32. The following two compounds are:





(a) epimers (b) disteremores (c) identical (d) enantiomers

33. Label the following pairs correctly

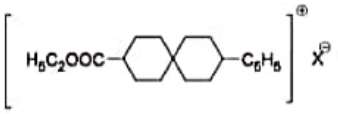
(I) 

(II) 

(a) Enantiomers, diastereoisomers (b) Homomers, enantiomers

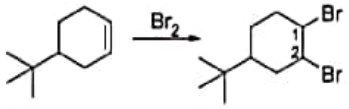
(c) Homomers, diastereoisomers (d) Constitutional isomers, enatiomers

34. The number of stereoisomers that are possible for the following compound are:



(a) 1 (b) 2 (c) 3 (d) 4

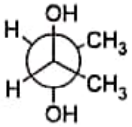
35. In the reaction given below, the orientation of two bromine substituents in the product is:

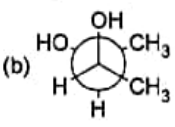


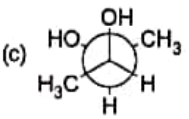
(a) equatorial at both C-1 and C-2 (b) equatorial at C-1 and axial at C-2

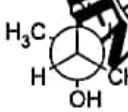
(c) axial at C-1 and equatorial at C-2 (d) axial at both C-1 and C-2

36. Which one of the following is the stablest conformation of butane-2, 3-diol?

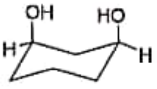
(a) 

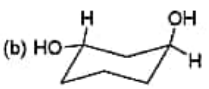
(b) 

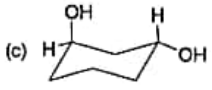
(c) 

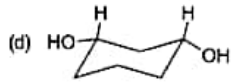
(d) 

37. The preferred conformation of cis-1, 3-dihydroxy cyclohexane is.

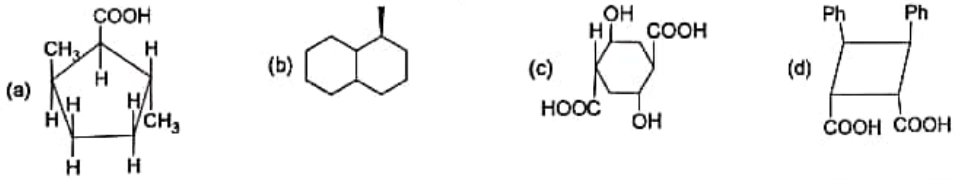
(a) 

(b) 

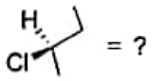
(c) 

(d) 

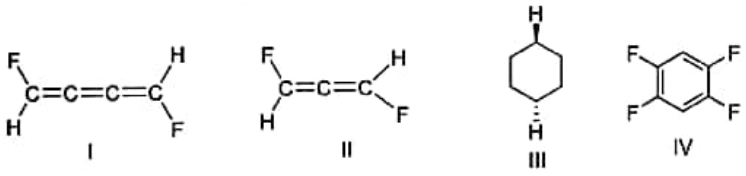
38. For 3-chloro utan-2-ol, which one of the following is true?
    (a) 2S, 3S and 2R, 3S is a pair of diastereomers while 2R, 3S and 2S, 3R is a pair of enantiomers.
    (b) 2S, 3S and 2R, 3S is a pair of diastereomers while 2R, 3R and 2S, 3S is a pair of enantiomers.
    (c) 2R, 3R and 2S, 3S is a pair of diastereomers while 2S, 3S and 2R, 3S is a pair of enantiomers.
    (d) 2R, 3R and 2S, 3S is a pair of diastereomers while 2R, 3R and 2S, 3S is a pair of enantiomers.
39. Which species exhibits a plane of symmetry?



40. Choose the structure dose not have the same absolute configuration as the structure given below?

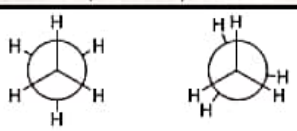


41. Which one of the following statement is true?
    (a) Diastereomers are a pair of isomers related spatially as object and mirror image.
    (b) Diastereomers can often be separated by fractional crystallization.
    (c) Diastereomers have identical physical and chemical properties.
    (d) Diastereomers rotate the plane of polarization of plane-polarization light to an equal but opposite extent.
42. Which of the following molecule have dipole moment?



    (a) I and IV (b) II and III (c) III and IV (d) II and IV

43. On Pluto, where everything is frozen, astronauts discovered two forms of 1, 2-dibromoethane: gauche and anti. Assuming that there are no rotations around single bonds, which statement about the two forms is correct?
    (a) They are enantiomers (b) they are diastereomers
    (c) they are meso compounds (d) both will show optical activity
44. Which type of conformation is shown by I and II?



I II

(a) I is eclipsed, II is staggered (b) II is eclipsed, I is staggered
(c) both are eclipsed (d) both are staggered

45. The most stable conformation of ethylene glycol is
(a) anti (b) gauche (c) partially eclipsed (d) gully eclipsed

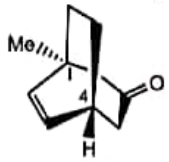
46. In the boat conformation of cyclohexane, the most destabilizing interaction is
(a) eclipsing (b) 1, 3-diaxial (c) 1,3-diequatorial (d) flagpole-flagpole

47. For which of the following compound enantiomer is not possible?
(a) Phenyl ethane (b) α -hydroxy propionic acid
(c) 2-amino pentane (d) 1-chloro-1-phenyl ethane

48. In sawhorse projection, a fully eclipsed form can be transformed to anti-staggered form by a rotation of
(a) 60° (b) 90° (c) 180° (d) 360°

49. In the most stable conformation of trans-1-t-butyl-3-methycyclohexane, the substituents at C-1 and C-3, respectively, are
(a) axial and equatorial (b) equatorial and equatorial
(c) equatorial and axial (d) axial and axial

50. The configurations at the two stereocentres in the compound given below are:



(a) 1R, 4R (b) 1R, 4S (c) 1S, 4R (d) 1S, 4S

ANSWER KEY

1. (b)	2. (c)	3. (d)	4. (b)	5. (b)	6. (b)	7. (d)	8. (c)	9. (a)	10. (a)
11. (b)	12. (c)	13. (c)	14. (a)	15. (d)	16. (b)	17.(a)	18. (a)	19. (a)	20. (a)
21. (d)	22. (a)	23. (a)	24. (b)	25. (b)	26. (c)	27. (a)	28. (c)	29. (b)	30. (a)
31. (a)	32. (d)	33. (c)	34. (b)	35. (a)	36. (c)	37. (a)	38.(a/b)	39. (d)	40. (b)
41. (b)	42. (d)	43. (b)	44. (b)	45. (b)	46. (d)	47. (a)	48. (c)	49. (c)	50. (a)