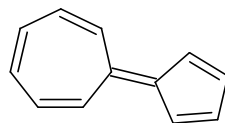


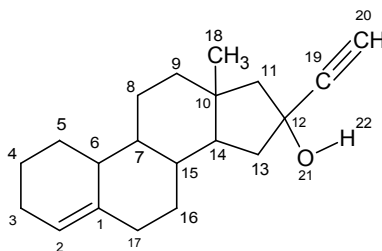
CHEMISTRY PAPER-II

- (b) Draw the structures of the following molecules: (10)
- | | |
|--|--|
| (i) 5-(2,2-Dimethylpropyl)nonane | (vi) 4-(2-Ethylbutyl)decane |
| (ii) 2,3-Dimethylhept-3-ene | (vii) 5-Ethyl-4,6-dimethylhept-4-en-2-yne |
| (iii) 1-Chloro-1-methoxy-2-methylbut-1-ene | (viii) 5,5-Dichloro-3-methylhepta-3,6-dien-1-yne |
| (iv) 6-Chloro-2-nitrooct-1-en-3-yne | (ix) 6-bromo-5-chloro-9-nitropentadecane |
| (v) 8-Chloro-7-methoxy-5-methyl-4-nitroundec-5-ene | (x) 6-chloroocta-1,3-diyne |
- (c) (i) The structure(I) given below has significant dipole moment. Which end of the molecule would you expect to owe positive charge, and which tend to be negative. (2)



(I)

- (ii) The structure(II) given below is a component of certain oral contraceptives: (3)

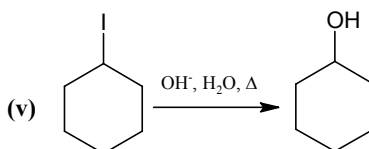
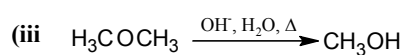
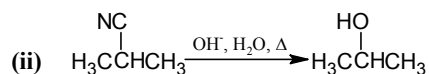
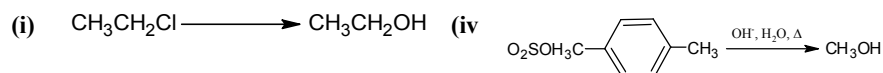


(II)

Locate in this structure an example of each of the following bonds or atoms

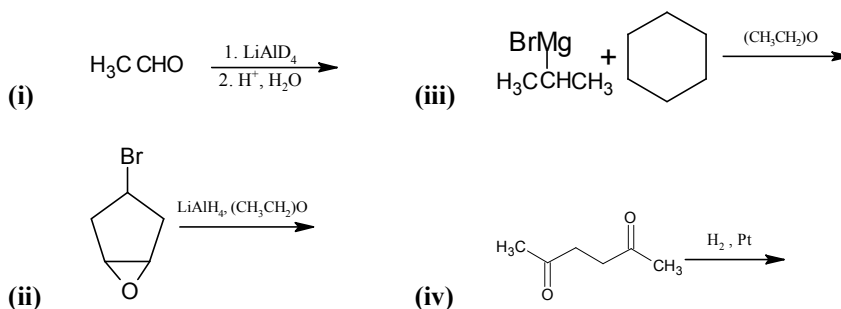
- A highly polarized covalent bond
- Sp-hybrid carbon atoms
- A nearly unpolarized covalent bond

- Q. No. 5. (a) Consider the reaction of bromocyclohexane with each of the four reagents below, and answer the questions below. Also write down the reaction mechanism in each case. (7)
- | | | | |
|----------------------|---------------|--------------------------|---------------------------|
| H_2O | OH^- | CH_3COOH | CH_3COO^- |
| (i) | (ii) | (iii) | (vi) |
- (i) What is the most important type of reaction mechanism in each case?
 (ii) Which reagent gives the most elimination product?
 (iii) Which reagent is most useful in synthesizing the alcohol?
- (b) Evaluate each of the possible alcohol syntheses below as being good (the desired alcohol is major or only product), not so good (the desired alcohol is a minor product, or worthless). (5)

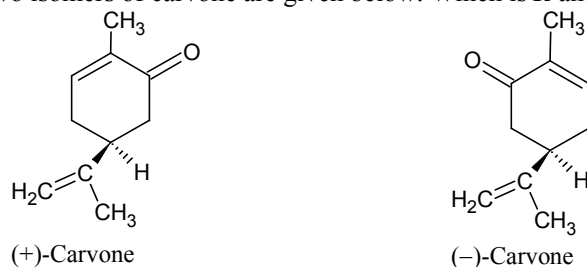


CHEMISTRY PAPER-II

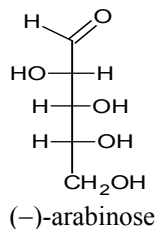
- (c) Write the major product(s) of each of the following reactions. It is implied that aqueous work-up has taken place in all those cases that require it to obtain the organic product. (8)



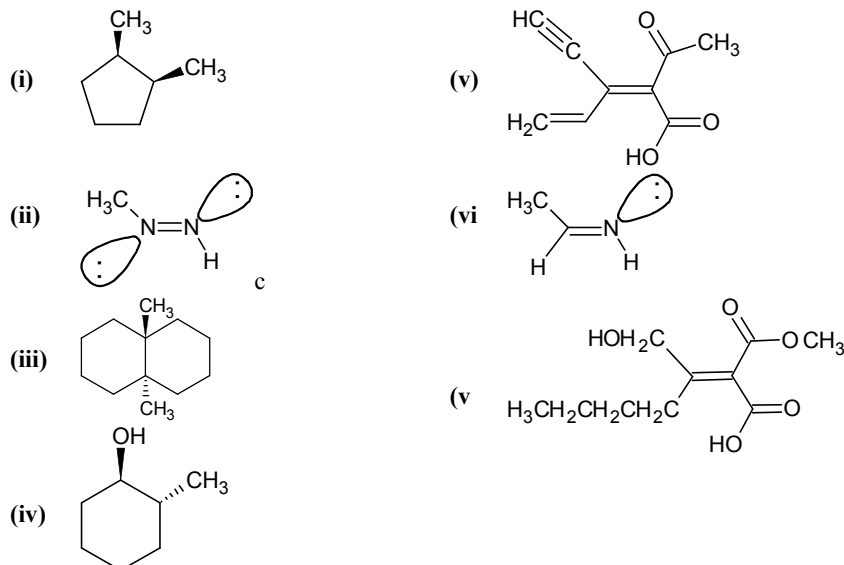
- Q. No. 6. (a) The two isomers of carvone are given below. Which is *R* and which is *S*? (2)



- (b) The structure of compound given below is a sugar called (-)-arabinose. Its specific rotation is -105° . (3)



- (i) Draw enantiomer(s) of (-)-arabinose
 (ii) Draw diastereomer(s) of (-)-arabinose
 (iii) Does (-)-arabinose have any optically inactive diastereomers? If it does, draw one.
- (c) Assign E,Z designation to the following structures. (7)



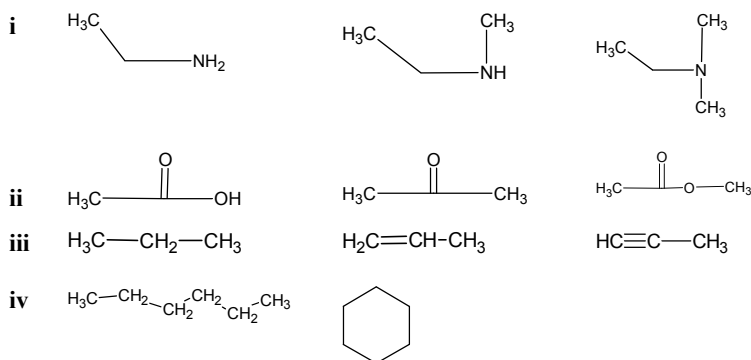
CHEMISTRY PAPER-II

- (d) Draw the structures of the product(s) described for each reaction. Specify all aspects of the stereochemistry. (8)
- (i) Stereospecific anti addition of bromine to cis- and trans-cinnamic acid.
- (ii) Methanolysis of S-3-bromooctane with 6% racemization.
- (iii) Stereospecific syn thermal elimination of acetic acid from 1R,2S-diphenylpropyl acetate
- (iv) Stereoselective epoxidation of bicyclo[2.2.1]hept-2-ene proceeding 94% from the exo face.

Q. No. 7. Write a brief account on the following: (5 each) (20)

- (a) Biological importance of starch (c) Primary structure of Proteins
 (b) Classification of Amino acids (d) Glycogenesis

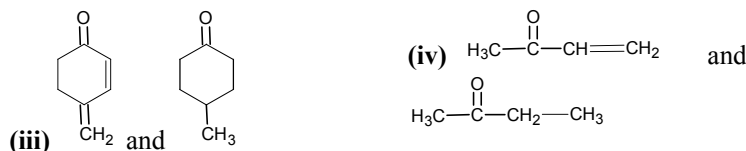
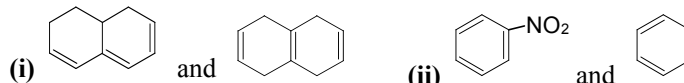
Q. No. 8. (a). Differentiate following using IR Spectroscopy? (4)



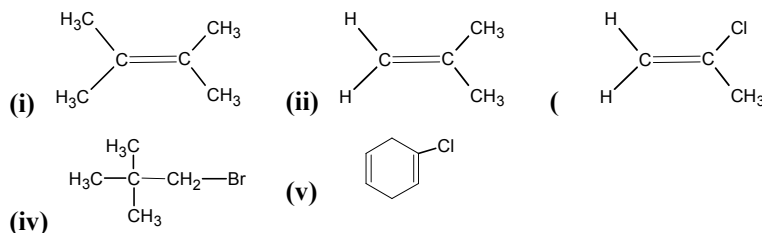
(b). What type of electronic transition are possible in the following compounds? (2)

- (i) Butadiene (iii) Acetaldehyde
 (ii) Diethyl ether (iv) Trimethylamine

(c). How will you distinguish the following compounds using UV/Visible spectrophotometer? (4)



(d). Give the chemical shift of the following compounds for each proton (5)



(e). The mass spectrum of compound shows following peaks: (5)
 $m/e = 120$, relative intensity = 20% (M^+ peak), $m/e = 105$, relative intensity = 80%,
 $m/e = 77$, relative intensity = 96%, $m/e = 43$, relative intensity = 35%.
 Assign the structure which would be expected.
