

[76/A-15]

No of Printed Pages: 04

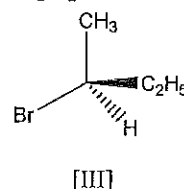
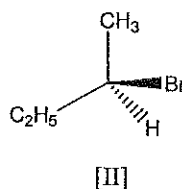
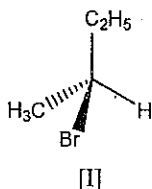
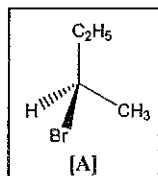
SARDAR PATEL UNIVERSITY
M.Sc. (CHEMISTRY), Semester - I, Examination
Wednesday, 20th November 2019
PSO1CCHE02 - ORGANIC CHEMISTRY - I

Time: 10:00 am - 01:00 pm

Maximum Marks - 70

Q.1 Select the correct answer from the option given below for each of the following questions. [08]
 Write **ONLY ANSWERS** in the provided answer book. [e.g. Q.1 (1)-(b)]

(1) Which of the following structures (I to III) are the enantiomers of the structure [A]?



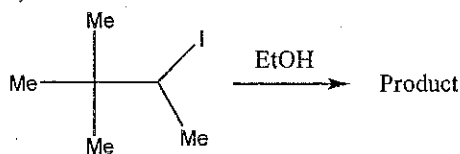
a) I and II

c) I and III

b) II and III

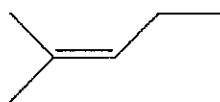
d) I, II and III

(2)



Product of the above reaction?

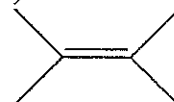
a)



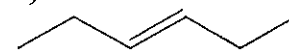
b)



c)



d)



(3) **Assertion (A):** Addition of Br₂ to 2-butene is a stereoselective reaction.

Reason (R): Addition of Br₂ to 2-butene is an electrophilic and is a two-step process.

a) Both A and B are true

b) Both A and B are false

c) A is true and B is false

d) A is false and B is true

(4) Which of the following sentences is/are not correct for Pinacol-pinacolone rearrangement?

i) 1,2-diol gets converted into carbonyl compound

ii) carbocation is generated as an intermediate

iii) carbanion is generated as an intermediate

iv) 1,3-rearrangement take place

Option:

a) ii and iii

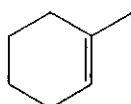
b) iii and iv

c) i and iii

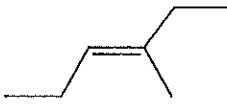
d) ii and iv

(5) Which of the alkenes shown below would produce a chirality center upon hydrohalogenation?

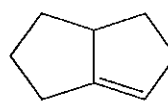
a)



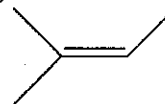
b)



c)

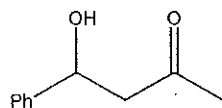


d)

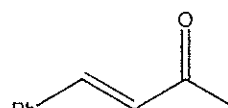


(6) Which of the following is the main product when one mole of propanone and two moles of benzaldehyde react in the presence of catalytic NaOH?

a)



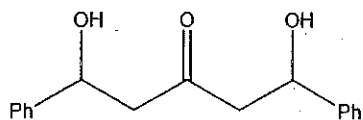
b)



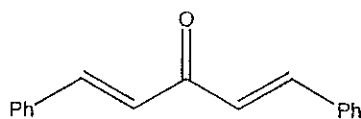
(1)

(P.T.O)

c)



d)



(7) The mechanism of formation of $C_6H_5NH_2$ by the action of $NaNH_2$ -liq NH_3 on C_6H_5Cl is an example of _____.

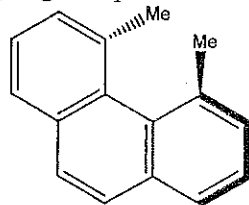
a) Nucleophilic substitution

b) Electrophilic substitution

c) Addition followed by elimination

d) Elimination followed by addition

(8) The correct statement about the following compound is



a) compound is chiral and has P configuration

b) compound is chiral and has M configuration

c) compound is achiral as it possesses C_2 -axis of symmetry

d) compound is achiral as it possesses plane of symmetry

Q.2 Answer ANY SEVEN of the following

[14]

(a) Why 2,2-dimethyl propanaldehyde cannot undergo benzoin condensation?

(b) Why cyclooctene shows chirality?

(c) Explain: β -branching in the substrate increases the chances of unimolecular elimination.

(d) Why diazonium salt should be taken in slightly acidic medium in diazo coupling reaction?

(e) All chiral centers are always stereogenic center but the reverse is not true.

(f) Explain: Formaldehyde does not give the product of Knoevenagel condensation with diethylmalonate.

(g) Give the spectral evidences for the formation of cyclic halonium ion in halogenation of alkene.

(h) State and explain Bredt's rule with suitable example.

(i) Define the term: Pseudo asymmetric center and Metamers.

Q.3

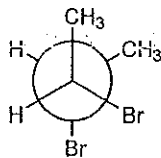
(a) Explain the followings:

i) Enantiotopic and homotopic ligands can co-exist.

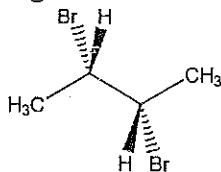
[03]

ii) Find out the relationship between following molecules

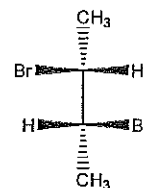
[03]



[I]



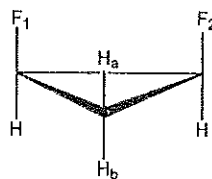
[II]



[III]

(b) Explain the following:

i) Explain the topic relationship between H_a , H_b and between F_1 , F_2 by considering symmetry criteria. [03]



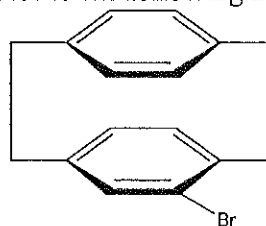
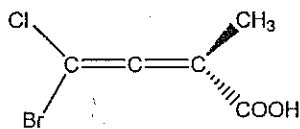
Page 2 of 4

(2)

ii) Describe the significance of Fischer Projection formula. [03]

OR

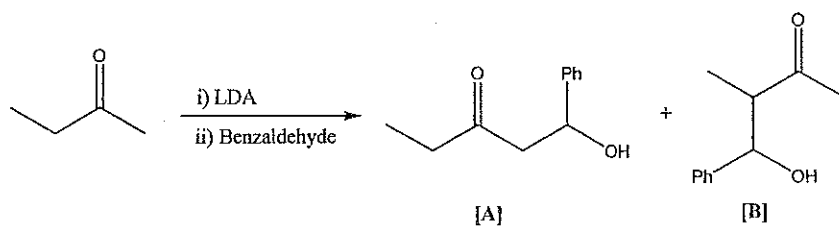
(b) Explain the step by step method to assign the chirality descriptor to the following molecule. [06]



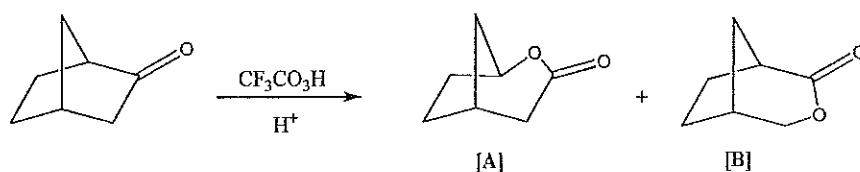
Q.4

(a) Give the appropriate mechanism for the following scheme. Which product obtained in a major yield? Justify your answer. [06]

i)



ii)

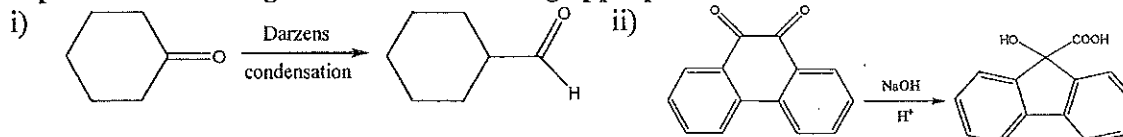


(b) Justify the followings:

- i) 1,2-hydride shift in Wagner Meerwein rearrangement does not change the molecular skeleton. [03]
ii) Dickman condensation is an intramolecular Claisen condensation. [03]

OR

(b) Explain the following transformation using appropriate mechanism. [06]



Q.5

(a) Answer the following as directed:

- i) Dehydrochlorination of neo-menthylchloride, the process is governed by the thermodynamic stability of the product. [03]
ii) Bromination of cis-2-butene is a stereoselective as well as stereospecific process explain. [03]

(b) Justify the followings:

- i) Cope Elimination reaction is more *syn*-stereoselective than Chugaev elimination reaction. [03]
ii) The rate of dehalogenation can be determined by the steric effect experienced in the transition state. [03]

OR

(b) Answer the followings:

- i) Explain: *Anti*-stereoselectivity is observed in bimolecular elimination [03]
ii) "Orientation of addition reaction is governed by the Markonikoff's rule" explain it with suitable example. [03]

Q.6

(a) Answer the following as directed:

- i) Explain: Aromatic compound does not undergo addition reaction but they undergo substitution reaction [03]
- ii) Give the synthesis of 1,1-dimethyl-3,5-cyclohexadione. [03]

(b) Explain the followings:

- i) 1,3-butadiene heated at 45°C in the presence of HCl gives 1,4-adduct in a major yield while at -60°C gives 1,2-adduct in a major yield. [03]
- ii) Friedel Craft acylation is preferred over Friedel Craft alkylation to prepare ethyl benzene from benzene [03]

OR

(b) Answer the followings:

- i) Give the evidences for the benzyne as an intermediate [03]
- ii) Justify: Electrophilic substitution on phenol is favored in ortho- and para-positions. [03]

