

M. Sc. CHEMISTRY
SECOND SEMESTER
ORGANIC CHEMISTRY-II
MSC - 202

(Use Separate Answer Scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

(PART-A : Objective)

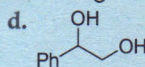
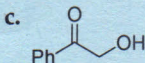
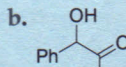
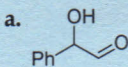
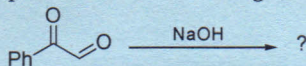
Time : 20 min.

Marks : 20

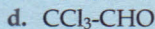
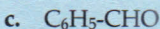
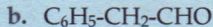
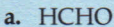
Choose the correct answer from the following:

1×20=20

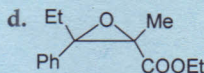
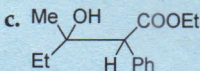
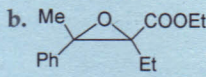
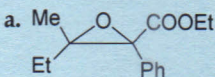
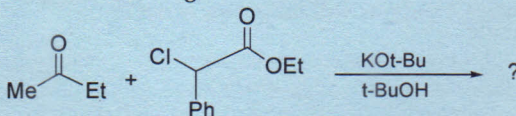
1. Write down the product in the following reaction



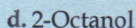
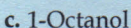
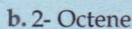
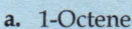
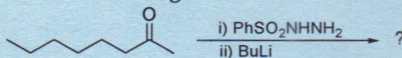
2. Which of the following will not undergo Cannizaro's reaction?



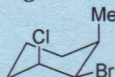
3. The product in the following reaction will be

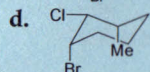
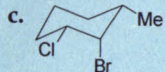
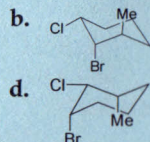
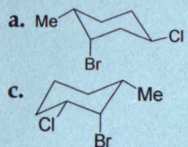


4. The major product in the following reaction will be

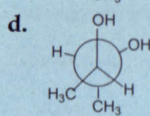
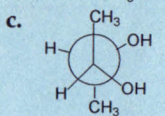
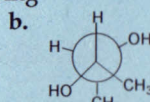
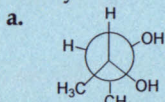


5. Ring flipping of the following conformation will lead to

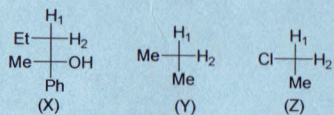




6. Identify the meso-compound from the following

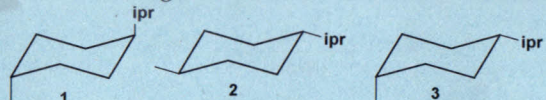


7. Stereochemical descriptors for the atoms labelled H_1 and H_2 in the structures respectively are



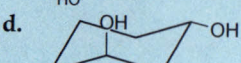
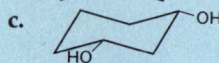
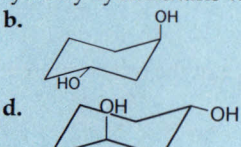
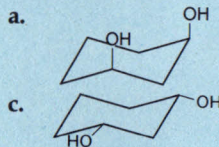
- X-diastereotopic, Y-enantiotopic, Z-homotopic
- X-homotopic, Y-diastereotopic, Z-enantiotopic
- X-diastereotopic, Y-homotopic, Z-enantiotopic
- X-enantiotopic, Y-homotopic, Z-diastereotopic

8. Stability of the following conformations will follow the order



- $1 > 2 > 3$
- $2 > 3 > 1$
- $2 > 1 > 3$
- $3 > 2 > 1$

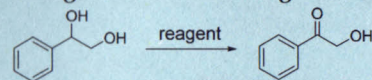
9. Which of the following conformers of 1-3 dihydroxy cyclohexane will be most stable?



10. Oxidation of menthol to menthone by Jones-reagent is an electron transfer process involving

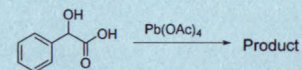
- two electrons
- four electrons
- six electrons
- eight electrons

11. Suitable reagent for the following reaction is



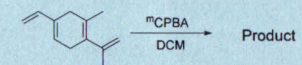
- PCC
- PDC
- MnO_2
- DMP

12. Product of the following reaction is



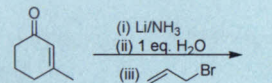
- Benzyl alcohol
- Benzaldehyde
- Benzoic acid
- Toluene

13. Product of the following reaction is



-
-
-
-

14. What product will be formed in the following reaction

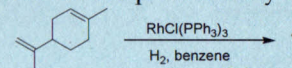


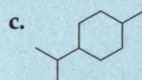
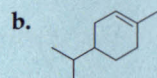
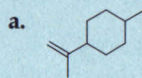
-
-
-
-

15. Which statement about hydroboration of propene is incorrect?

- Addition of B-H bond to the propene is Markovnikov addition.
- BH_3 acts as an electrophile
- The alkene is an electron donor
- Hydroboration followed by treatment with H_2O_2 gives propan-1-ol.

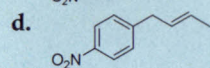
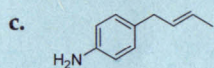
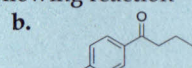
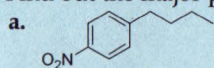
16. What product will be formed preferentially in the following reaction





d. None of these

17. Find out the major product formed in the following reaction



18. Which of the following compound does not give a tertiary alcohol upon reaction with methylmagnesium bromide? Assume the usual acid work up.

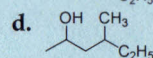
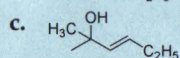
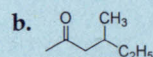
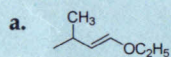
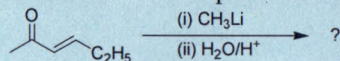
a. 3-methylpentanal

b. Ethylbenzoate

c. 4,4-dimethylcyclohexanone

d. 4-heptanone

19. The following transformation will predominantly yield



20. The reactivity order for different halides for reactions involving Bu_3SnH in presence of radical initiator is

a. Allyl halide > Benzyl halide > Ter alkyl halide > Vinyl halide

b. Benzyl halide > Allyl halide > Ter alkyl halide > Vinyl halide

c. Benzyl halide > Allyl halide > Vinyl halide > Ter alkyl halide

d. Ter alkyl halide > Vinyl halide > Allyl halide > Benzyl halide

(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

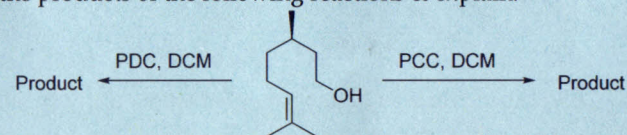
1. a. Match list A with list B

2x5=10

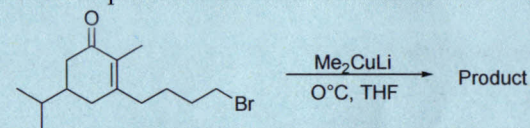
	A		B
I	Mukaiama Aldol condensation	i	α -halo ester
II	Darzen Condensation	ii	$\text{Pd}(\text{PPh}_3)_4$
III	Simons-Smith reaction	iii	Me_3SiCl
IV	Heck reaction	iv	CH_2I_2

b. Why in ethylene glycol *gauche* conformation is more favoured over *anti*-conformation?

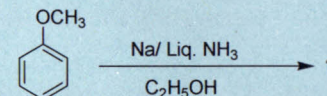
c. Write the products of the following reactions & explain.



d. Write the product with mechanism of the following reaction.

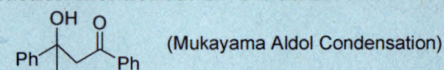


e. Predict the formation of the product with suitable mechanism in the following reaction

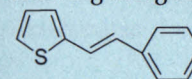


2. a. Prepare the following molecule with appropriate starting material using the reaction mentioned. Give mechanism.

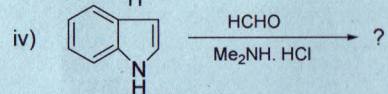
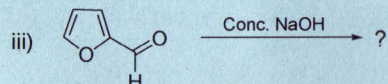
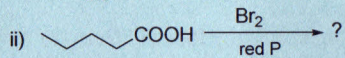
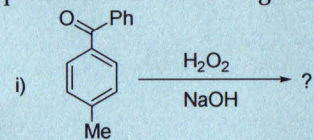
3+3+
4=10



b. Synthesise the following using Heck reaction. Give mechanism



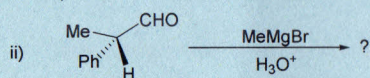
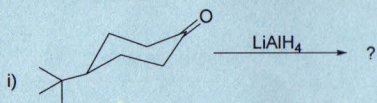
c. Write down the products in the following Reactions.



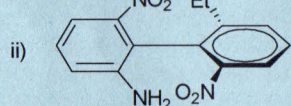
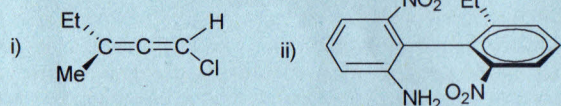
3. a. Specific rotation of an optically active compound is 40° . The mixture of enantiomers of this compound show a specific rotation of $+32^\circ$. What are the proportion of each enantiomers.

2+4+
2+2=
10

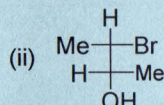
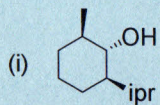
b. Write down the configuration of the major product in the following two reactions.



c. Give R/S configurations for the following.



d. Draw appropriate Chair conformation for (i) and Newman's projection for (ii)



4. a. Write notes on Robinson's annulations.

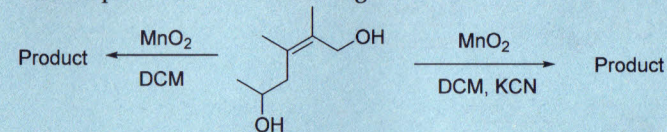
2.5+
2.5+
5
=10

b. How can you prepare, $\text{Ph}-\text{C}\equiv\text{C}-\text{Et}$, using Sonogashira coupling. Give mechanism

c. Explain what you mean by Stereo selective and stereo specific reactions. Explain with appropriate examples.

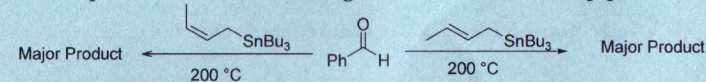
5. a. Write the products of the following reactions

3+5+
2=10



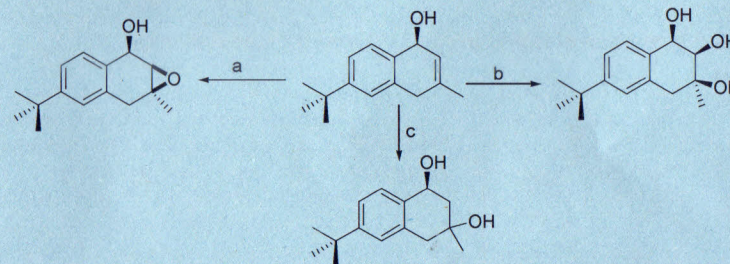
b. Explain the Prevost's and Woodward's dihydroxylation reactions with suitable examples.

c. Write the products of the following reactions after workup process.

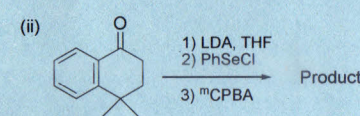
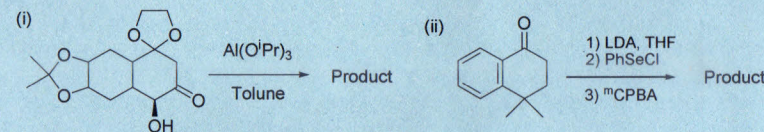


6. a. Write the suitable reagents for the following reactions

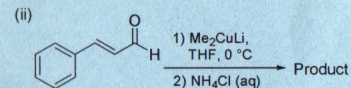
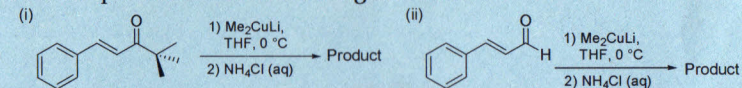
3+4+
3=10



b. Write the products of the following reactions with justification.



c. Write the products of the following reactions



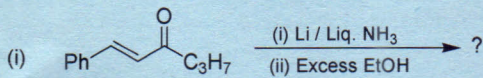
7. a. What is the use of Shapiro reaction? Explain.

2+3+3+
2=10

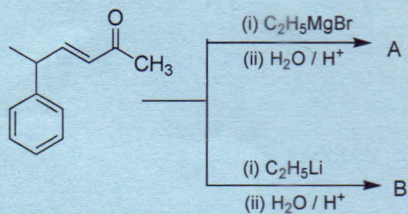
b. Explain the mechanism of heterogeneous hydrogenation in case of unsymmetrical alkenes. Also explain the stereochemistry of the hydrogenation.

c. Explain the regioselectivity of borane with suitable examples.

d. Predict the formation of the products with suitable mechanism



8. a. What is MPV reduction? Explain with suitable mechanism. 3+2+
 b. What product will be formed for the following reaction. 3+2=
 c. What is Simmons Smith reaction? Explain with examples. 10
 d. Predict the formation of major products A and B in the following reactions



== *** ==