



বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY
Question Paper

B.Sc. Honours Examinations 2022

(Under CBCS Pattern)

Semester - IV

Subject: CHEMISTRY

Paper : C 10-T

Organic Chemistry - IV

Full Marks : 40

Time : 2 Hours

Candidates are required to give their answer in their own words as far as practicable.

The figures in the margin indicate full marks.

Group - A

Answer any **four** questions from the following :

5×4=20

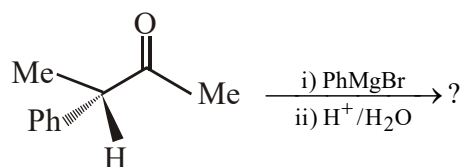
- (a) Distinguish Methyl benzoate and Phenyl acetate by IR spectroscopy. 2

(b) Define synthetic equivalent with an example. 1

(c) How many kinds of non equivalent proton are there $C_2H_5CH = CH_2$, label them. 2
- (a) Why do acetylenic proton resonate at upfield region with respect to ethylenic proton, though acetylenic hydrogen are more acidic than ethylenic hydrogen ? 3

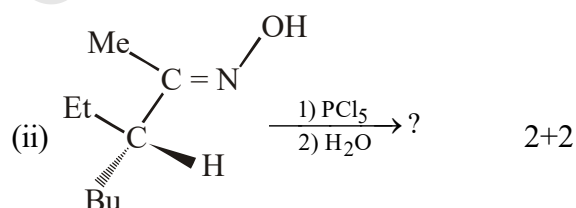
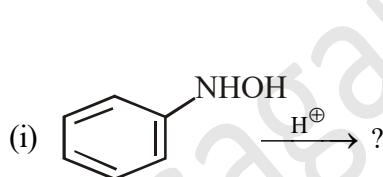
(b) How can you convert $ArNH_2$ to $ArNHMe$ exclusively without any $Ar NMe_2$? 2

3. (a) Predict the major product of the following reaction with proper explanation.



3

- (b) How high dilution technique can be utilized for large ring synthesis ? 2
4. What do you mean by diastereoselective aldol reaction ? Illustrate with proper example and with the help of Zimmermann-Traxler model. 5
5. (a) IR absorption due to C = O stretching occurs at higher frequency and higher intensity than the C = C stretching — explain. 2
- (b) Explain why a polar solvent usually shifts the $\pi-\pi$ transition to longer wavelengths? 2
- (c) What is auxochrome ? Give an example. 1
6. (a) Predict the product of the following reaction and give mechanism.



2+2

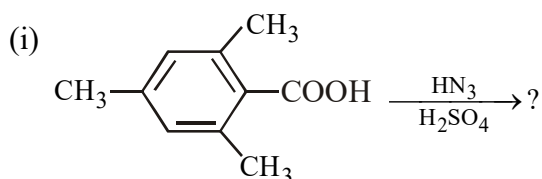
- (b) Diazoacetic ester is more stable than diazomethane — Explain. 1

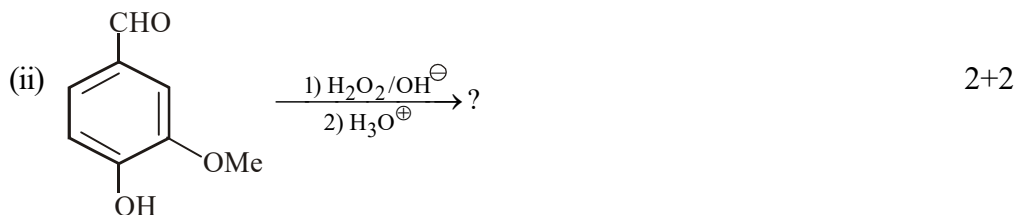
Group - B

Answer any *two* of the following questions :

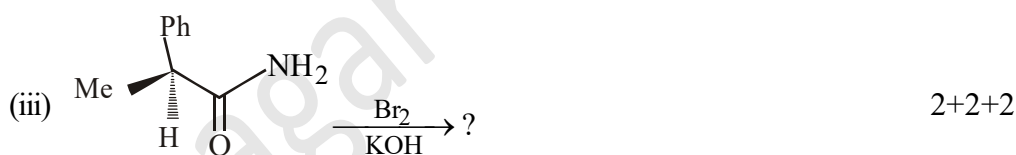
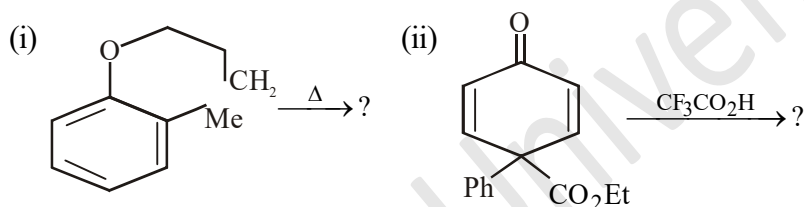
10×2=20

7. (a) How can you separate a mixture of primary, secondary and tertiary aliphatic amines by Hinsberg method ? 3
- (b) Explain what happens when cyclopentanone is treated with diazomethane ? 2
- (c) Find out the product(s) of the following reactions with plausible mechanism.

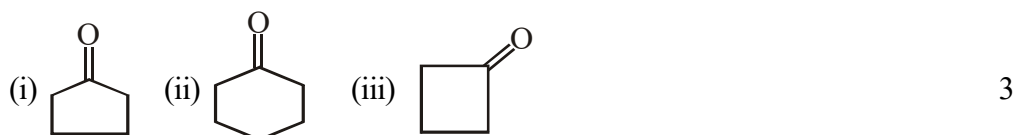




- (d) Define FAI with example. 1
8. (a) What is stereo selective reaction ? Give example. 2
- (b) Why TMS is used as reference compound in scanning ^1H NMR spectrum of a compound ? 2
- (c) Predict the product(s) of the following reactions with plausible mechanism.



9. (a) Predict the expected UV spectral change on addition of 1 drop of 5% NaOH to a solution of p-Cresol in spectral ethanol with justification. 2
- (b) How IR spectroscopy can be used to distinguish between the following compounds? Explain briefly



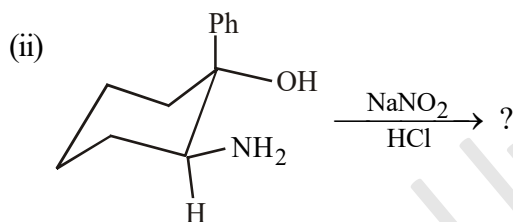
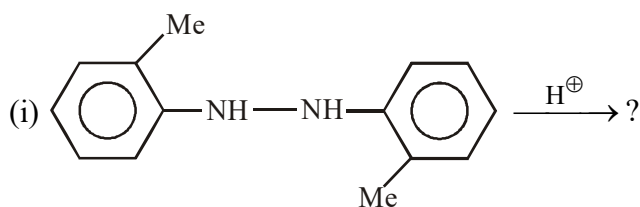
- (c) Discuss the effect of dilution by CCl_4 on IR absorption position of 'O—H' stretching of ethanol. 2
- (d) A compound of molecular formula $\text{C}_6\text{H}_{12}\text{O}$ shows a strong IR band at 1705 cm^{-1} and two singlet signals at $\delta 2.1$ and 1.2 in its ^1H NMR spectrum. Determine its structure. 3

10. (a) How can you distinguish between the following pairs ?

$\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$ and $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$ by ^1H NMR spectroscopy. 2

(b) What do you mean by shielding and deshielding of proton in ^1H NMR spectroscopy ? Discuss with example. 3

(c) Predict the product(s) with plausible mechanism of the following reactions.



$2\frac{1}{2} + 2\frac{1}{2}$