

MASTER OF SCIENCE (CHEMISTRY) (CBCS - 2018 COURSE)
M.Sc. (Chemistry) Sem-IV OC :SUMMER- 2022
SUBJECT : GREEN CHEMISTRY

Day : Thursday
 Date : 7/7/2022

S-20165-2022

Time : 03:00 PM-06:00 PM
 Max. Marks : 60

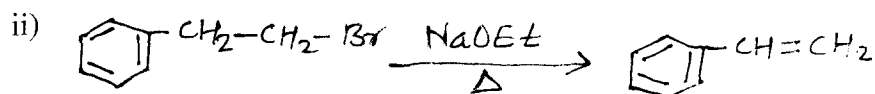
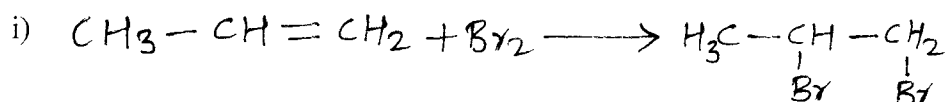
N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the sections should be written in **SEPARATE** answer book.

SECTION-I

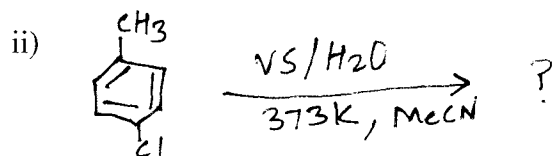
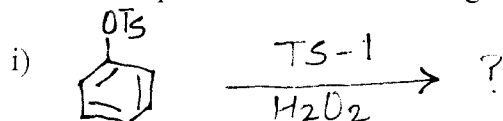
Q.1 Answer **ANY THREE** of the following: **(15)**

- a) What is atom economy? Calculate atom economy percentage for following synthesis (At.wt. Br=80)



- b) Define Green chemistry. Write in detail about twelve principles of green chemistry.

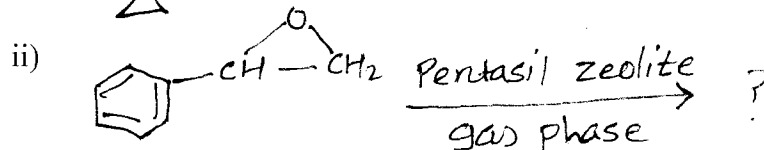
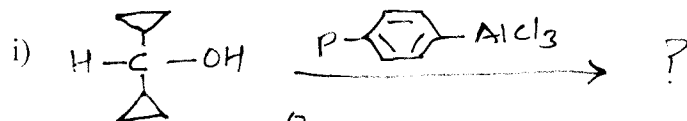
- c) Predict the products of the following:



- d) Write short note on Acid catalyst used in Green synthesis.
 e) What is polymer supported reagent? Give application with suitable example.

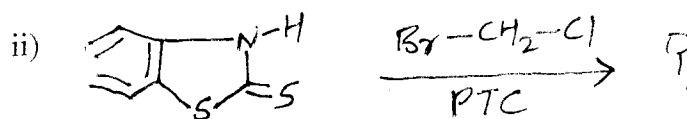
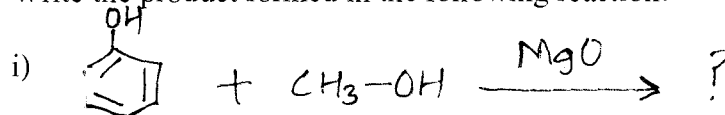
Q.2 Answer **ANY THREE** of the following: **(15)**

- a) Predict the products of the following:



- b) Define Green reagent. Explain in detail its application in synthesis with example.

- c) Write the product formed in the following reaction:



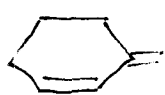
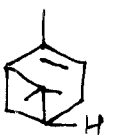
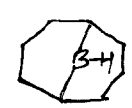
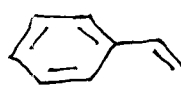
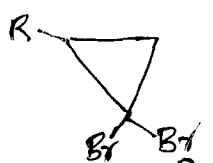
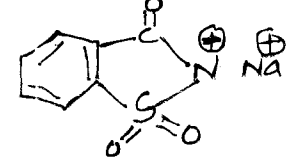
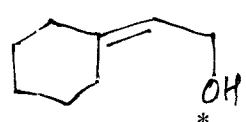
- d) Define phase transfer catalyst. Write down advantages of phase transfer catalyst in green synthesis.
- e) Explain C-alkylation of aldehyde and ketone using phase transfer catalyst.

SECTION-II

Q.3 Answer **ANY THREE** of the following: (15)

- a) Write a note of reaction vessel and reaction medium for microwave induced organic reaction enhancement.
- b) Explain four types of Ultrasonic equipments used for organic reactions.
- c) Explain microwave organic synthesis of phenolic ketones using Fries rearrangement.
- d) How hydroboration reaction is carried out using Ultrasonic method.
- e) Explain Decarboxylation reaction of Indole-2-carboxylic acids using microwave irradiation.

Q.4 Attempt **ANY SIX** of the following: (15)

- a) $\text{CH}_3\text{COCH}_2\text{CO}_2\text{Et} \xrightarrow[\text{PTC, Microwave}]{\text{RX} \cdot \text{KOH} - \text{K}_2\text{CO}_3}$?
- b) $\text{ArCN} \xrightarrow[\text{UV}]{\text{HO}^- / \text{H}_2\text{O}}$?
- c)  + R-Br $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{Li, Cu, Et}_2\text{O}}$?
- d)  +  $\xrightarrow[\text{UV}]{\text{THF, RT/hv}}$?
- e)  $\xrightarrow[\text{UV, stirring}]{\text{NaOH, CHCl}_3}$?
- f)  $\xrightarrow[\text{THF, UV}]{\text{Li or Mg}}$?
- g)  $\xrightarrow[\text{microwave irradiation}]{\text{R-X, silica gel}}$?
- h)  $\xrightarrow[3) \text{dil. HCl}]{1) \text{Triethyl ortho acetate, 2) microwave, 10 min}}$?