

I Semester M.Sc. Examination, January 2015 (CBCS) CHEMISTRY C – 105 : Green Synthesis (Soft Core)

Time : 3 Hours

Instruction: Answer question No. **1** and **any five** of the remaining questions.

- 1. Answer any ten of the following :
 - a) What are the limitations of ultrasound synthesis?
 - b) Write the frequency range of microwaves and sound waves used for organic synthesis.
 - c) What is meant by percentage atom utilisation?
 - d) What are ionic liquids ? Give an example for basic ionic liquid.
 - e) What are the properties of a supporting polymer required to attach a reagent?
 - f) Write the structure of [18] crown 6 ether and mention its use.
 - g) What are the advantages of polymer supported reagents in organic synthesis?
 - h) What are phase transfer catalysts ? Give an example.
 - i) How is superoxide anion generated?
 - j) Give the starting materials for the synthesis of pyrimidine derivatives from Biginelli reaction.
 - k) What are multicomponent reactions ? Give an example.
 - I) Mention the advantages of multi component reactions.

Answer any five questions.

2. a) Predict the products in the following microwave assisted synthesis.

 $\begin{array}{cccc} R & & & & \\ I & & \\ O & & & I \\ O & & & I \\ C_6 H_5 \end{array} \xrightarrow{\begin{subarray}{c} Montmorillonite, KSF \\ Microwaves \end{array}} A + B$

(10×2=20)

Max. Marks: 70

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(5×10=50)

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- b) What are the criteria for selecting a solvent for microwave assisted reactions?
- c) Predict the products in the following reaction and write the mechanism of the reaction. (3+3+4=10)



- 3. a) Explain sanochemical esterification with an example.
 - b) Predict the products in the following reaction and write the mechanism of the reaction. (5+5=10)

- 4. a) Write any three applications of ionic liquids.
 - b) Predict the product in the following reaction with suitable mechanism.

Polymer
$$- coocH + CH_3 - CH_3 - THF + B$$

 $CH_3 - CH_3 - CH_3 - THF + B$

c) Discuss the synthesis of polystyryl boronic acid and mention its use.

(3+3+4=10)

- 5. a) How is polymer supported AICl₃ prepared ? Explain its application in acetal formation reaction.
 - b) Explain the application of sulfonazide polymer in diazo transfer reaction. (6+4=10)
- 6. a) Discuss the mechanism of phase transfer catalysis taking the reaction of NaCn with 1 chlorooctane.
 - b) Explain the oxidation of cyclohexane with H_2O_2 under PTC conditions. (5+5=10)
- 7. a) Discuss the nomenclature of crown-ethers.
 - b) Explain the cation deactivation reaction using crown-ethers with suitable example.
 - c) Give an example for N-alkylation reaction using crown ethers. (3+4+3=10)
- 8. a) Discuss the green synthetic rate of Baylis-Hilmann reaction.
 - b) Explain the perspectives of multi component reactions in green chemistry.

(5+5=10)