U.G. 5th Semester Examination - 2021

CHEMISTRY

[HONOURS]

Discipline Specific Elective (DSE)

Course Code : CHEM-H-DSE-T-2C

Full Marks : 40 Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

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

1. Answer any **five** questions from the following: 2×5=10

a) What is the role of susceptors in the microwave assisted reactions?

b) Explain the term “Cradle to cradle” and “Cradle to gate”.

c) Between H_2O and D_2O which has higher cohesive energy density and why?

d) "Microwave radiation is a non- ionizing radiation" - Explain this statement.

e) In ultrasound equipment which material converts electrical energy into rapid mechanical vibrations?

f) "Direct interaction between wave and reactants to induce a chemical reaction is not possible”- Explain this statement.

g) Calculate the atom economy of the following reaction:

$$CH_3CH{=}CH_2 + Cl_2/H_2O \rightarrow CH_3CHOHCH_2Cl$$

h) What are the basic differences between atom economy and E-factor?

2. Answer any **two** questions: 5×2=10

a) Outline the greener synthesis of Ibuprofen and calculate the percentage of atom utilization. 3+2

b) How can you explain the rate enhancement of unimolecular and multimolecular reactions in micellar medium compared to aqueous medium? 5

c) i) What is cohesive energy density? 2

ii) "Nature of dienophile shows a considerable solvent effect in Diels-Alder reaction" - Explain with example. 3

d) What is called super critical fluid? Give an example of surfactant which can form micelle in supercritical carbondioxide. Describe its function. 1+2+2

3. Answer any **two** questions: 10×2=20

a) i) What is working definition of Green Chemistry? Why is it necessary? 1+2

ii) What are the basic goals of Green Chemistry? 3

iii) Explain limitations/obstacles in the pursuit of the goals of Green Chemistry. 4

b) i) Give example of microwave assisted oxidation and decarboxylation reaction. 2+2

ii) Give brief account of Flixborough accident and Bhopal gas tragedy. 3+3

c) i) What is ionic liquid? For what reasons, ionic liquid can replace the conventional solvents for chemical reaction? 2+3

ii) Why specific conductivity of ionic liquid is low? 2

iii) What is environmental quotient and life cycle assessment? 3

d) i) What are the advantages of PEG over water, ionic liquid etc.? 3

ii) Give two examples of heterocyclic ring synthesis using PEG as reaction medium. 2+2

iii) What is fluorous biphasic solvent(FBS)? "FBS is ideal for reactions involving non-polar reactants and polar products"- Explain. 1+2

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