

U.G. 5th Semester Examination - 2020

CHEMISTRY**[HONOURS]****Discipline Specific Elective (DSE)****Course Code : CHEM-H-DSE-T-2C**

Full Marks : 40

Time : 2½ 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: $2 \times 5 = 10$
- What is the working definition of green chemistry?
 - Why microwave is a non-ionizing radiation? Give an example of ionizing radiation.
 - What are differences between microwave heating and conventional heating?
 - What is supercritical fluid? Name few commonly used supercritical fluids.
 - Explain why biofuel is renewable source of energy but not fossil fuel?
 - What are oils and fats? What is the difference between them?

[Turn over]

- vii) What is biodegradable polymer? Give an example that is industrially useful.

2. Answer any **five** questions: $3 \times 5 = 15$
- What is susceptors in microwave induced reaction? Give an example where ionic liquid acts as a susceptors. $1 \frac{1}{2} + 1 \frac{1}{2}$
 - What is cavitation? Name different types of cavitation and specify which type is mainly responsible for chemical reaction. $1 + 2$
 - Give the examples of microwave assisted oxidation and decarboxylation reactions. $1 \frac{1}{2} + 1 \frac{1}{2}$
 - Predict the products A and B with suitable explanation. 3
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- v) What is biodiesel? How does the use of side product during biodiesel synthesis reduce the cost of production? $1 + 2$

vi) Describe the role of supercritical CO₂ in dry cleaning industry. 3

vii) Define 'Atom Economy', 'E-Factor' and 'Environmental Quotient.' 1+1+1

3. Answer any **three** questions: 5×3=15

i) Why oxidation of cyclohexane or cyclohexanol to adipic acid is not considered as green synthesis? Write down one green approach for the synthesis of adipic acid. 2+3

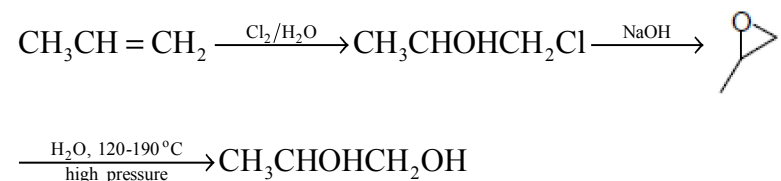
ii) Write down twelve principles of green chemistry. 5

iii) Calculate the atom economy (AE) for the following reactions and explain which one is greener synthesis of propylene glycol and why? 5

iv) a) What is ionic liquid? Why it is called designer solvent?

b) What characteristics of water make it benign solvent? 1+2+2

Reaction 1:



Reaction 2:

