

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5039

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Unique Paper Code : 2174001201

Name of the Paper : GE: Green Chemistry

Name of the Course : B.Sc. (H)

Semester : II/IV/VI/VIII

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions out of six.
3. All questions carry equal marks i.e. 15 marks.
4. Attempt all parts of the questions together.

1. (a) Fill in the blanks:

(5)

- i) Greater the waste generated, _____ will be the E-Factor.
- ii) Real-time analysis of the reaction process helps in preventing _____.
- iii) _____ = f (hazard x exposure).
- iv) _____ is extracted from orange peel using supercritical CO₂.
- v) Green Chemistry aims at minimizing the use of _____ chemicals.

(b) Write one-word answers for the following questions:

(5)

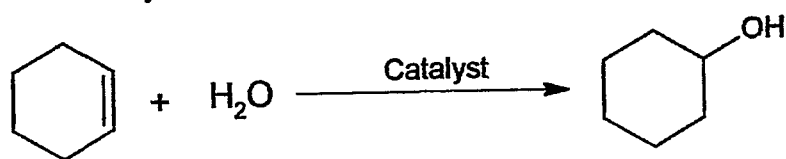
- i) A substance at a temperature and pressure above its critical point, where distinct liquid and gas phase do not exist.
- ii) The process of employing catalyst for speeding up chemical reactions that require light.
- iii) Chemistry involving the design of chemical products and processes that reduce or eliminate generation of hazardous substances.
- iv) The green and universal solvent.
- v) It measures the efficiency of a chemical process by calculating the ratio of waste generated to the product produced.

(c) Discuss the concept of waste and pollution prevention hierarchy.

(5)

P.T.O.

2. (a) What are the green solvents? Discuss different types of green solvents in brief. (5)
 (b) Discuss the importance of Green Chemistry in solving human health problems. (5)
 (c) What are the goals of green chemistry? How can we achieve these goals? (5)
3. (a) Which chemical was responsible for the Flixborough accident? Give the conventional and safer alternative methods for the synthesis of cyclohexanol. (5)
 (b) What are the Rightfit pigments? How are these better than the normal organic and inorganic pigments? (5)
 (c) Define Atom economy. Calculate it for the following reaction: (5)



4. (a) Match the following: (1x5=5)

A	B
i) CO ₂ as solvent	(a) Maximum utilization of reactants
ii) Atom Economy	(b) Polylactic acid
iii) Green energy	(c) Grinding
iv) Compostable plastic	(d) Benzene
v) Mechanochemical Synthesis	(e) Dry cleaning
	(f) Microwave

- (b) What is catalysis? Discuss the asymmetric catalysis. Give its advantages (5)
 (c) Discuss the green metrics to assess the greenness of a reaction. (5)
- 5) Differentiate between the following: (with suitable examples) (*any three*) (3x5=15)
 a) Biocatalysis and Photocatalysis
 b) E-Factor and Atom Economy
 c) Catalytic reagents and Stoichiometric reagents
 d) Organic Solvents and Supercritical fluids
- 6) Write short notes on the following: (*any three*) (3x5=15)
 a) Green Chemistry and Sustainability
 b) Ionic liquids
 c) Bhopal gas tragedy
 d) Surfactants for CO₂