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(7 pages)

Reg. No. :

Code No. : 20068 E Sub. Code : CSCH 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Third Semester

Chemistry

Skill Based Subject — GREEN CHEMISTRY

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. The percentage ratio of actual and theoretical masses of the products _____.
- (a) atom economy (b) yield
(c) mass intensity (d) mass productivity

2. The percentage ratio of molecular weight of product and molecular weight of reactants is called _____.
- (a) yield
(b) carbon efficiency
(c) atom economy
(d) mass intensity
3. The green solvent which is used in house hold cleaners to remove stains is _____.
- (a) citric acid (b) vinegar
(c) hydrochloric acid (d) benzoic acid
4. Select the coolant in refrigerator
- (a) CFC (b) CCl₄
(c) CHCl₃ (d) HCHO
5. Which of the following is not a category of catalyst?
- (a) homogeneous (b) heterogeneous
(c) enzymatic (d) artificial

6. Which of the following statement regarding the use of biocatalyst is false?
- (a) derived from living organism
 - (b) toxic than the chemical catalyst
 - (c) used in normal temperature and pressure
 - (d) contamination of the product by the catalyst is avoided
7. The starting materials used in the green synthesis of citral _____.
- (a) isobutene and formaldehyde
 - (b) isoprenol
 - (c) isoprenal
 - (d) β -pinene
8. The rearrangement involved in the green synthesis of paracetamol is _____.
- (a) Claisen rearrangement
 - (b) Hofman rearrangement
 - (c) Wagner rearrangement
 - (d) Beckman rearrangement

9. Which of the following is not an example of a biomass energy source?
- (a) Ethanol
 - (b) Cow dung
 - (c) Atomic energy
 - (d) None of the above
10. Which gas is called as biogas?
- (a) Hydrogen gas
 - (b) Nitrogen gas
 - (c) Propane gas
 - (d) Gobar gas

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the term atom economy and carbon efficiency with example each.
- Or
- (b) Define green chemistry. Explain the need and goal of green chemistry.

12. (a) Describe the advantages of using (SCF) Super Critical Fluids as solvents.

Or

- (b) How will you extract natural product using Super Critical Fluids?
13. (a) Write short notes on Tetra Amino Macro Cyclic (TAMC) Catalyst.

Or

- (b) Discuss the following green catalyst with their reactions :
- (i) Acid catalyst
- (ii) Basic catalyst

14. (a) Explain the following reaction assisted by microwaves : Fries rearrangement.

Or

- (b) Write a short note on Diels Alder reactions.
15. (a) Define Green chemistry and its types of Green chemistry.

Or

- (b) Write a short note on hydrogen storage and its applications.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss briefly "the concept of selectivity".

Or

- (b) Discuss the Twelve principles of green chemistry with their explanation.
17. (a) Discuss the synthetic applications of super critical CO₂ in food pharma and chemical industries.

Or

- (b) What are ionic liquids? Discuss their applications in organic synthesis.
18. (a) Define Polymer supported catalyst? Give two examples and their catalyst reactions.

Or

- (b) Write two examples each of microbial oxidation and reduction catalyst and their catalytic reactions.

19. (a) Explain the following reactions assisted by ultra sound
- (i) oxidation
 - (ii) reduction
 - (iii) cannizaro reaction.

Or

- (b) Explain the following reactions assisted by microwaves :
- (i) Hofman elimination
 - (ii) Claisen rearrangement.
20. (a) Define Solar energy. Discuss the applications of solar energy.

Or

- (b) Write a short note on :
- (i) Bio fuel
 - (ii) Bio gas.