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Reg. No. :

Code No. : 20469 E Sub. Code : CSCH 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Chemistry

Skill Based Subject – GREEN CHEMISTRY

(For those who joined in July 2021 – 2022 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following is not a principle of green chemistry?
- green solvents as auxiliaries
 - use of renewable feed stock
 - use of hazardous solvents
 - all the above

2. Select the wrong statement
- Rearrangement reactions have 100% atom economy
 - Stoichiometric reagents are superior to catalytic reagents
 - Arrangement reactions have 100% atom economy
 - Addition reactions have 100% atom economy
3. Choose a non-green solvent?
- Ionic liquids
 - Chloroform
 - Water
 - Super critical CO₂
4. Carbon dioxide exists as a supercritical fluid at
- Room temperature and 1atm pressure
 - 500°C and 1 atm pressure
 - 31°C and 73 atm pressure
 - 310°C and 3 atm pressure
5. Indicate the biocatalyst from the following
- polystyrene-AlCl₃
 - carbonic anhydrase
 - benzene
 - OsO₄

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6. Select the wrong statement
- Biochemical conversion usually involves one step
 - Bio-catalyst reactions are fast
 - Heavy metal catalysts are green catalyst
 - Bio-catalyst reactions are stereospecific
7. In a chemical reaction the requirement of energy is kept to a minimum by using _____.
- microwave radiation
 - sonication
 - photochemical activation
 - x-ray
8. Which of the following reaction can be carried out using microwave?
- esterification
 - decarboxylation
 - claisen rearrangement
 - all the above
9. What is the source of solar energy?
- wind
 - waves
 - sun light
 - hydrogen energy

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10. _____ is a non-renewable energy sources.
- Solar energy
 - Wind energy
 - Wave energy
 - Nuclear energy

PART B — (5 × 5 = 25 marks)

Answer ALL questions by choosing (a) or (b).

Each answer should not exceed 250 words.

11. (a) Prove the atom economy of addition reaction is 100%.
- Or
- (b) Criticize the importance of E-factor green chemistry.
12. (a) What are green solvents? Give its characteristics.
- Or
- (b) Discuss the application of ionic liquids
13. (a) Explain different types of green catalysts.
- Or
- (b) Outline the role of enzymes in chemical reaction.

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14. (a) Microwave radiation is suitable for polar medium. Illustrate with an example.

Or

(b) Comment on the role of ultrasound in esterification reaction.

15. (a) Write the utility of Biomass energy.

Or

(b) Elaborate the applications of solar energy.

PART C — (5 × 8 = 40 marks)

Answer ALL questions by choosing (a) or (b).

Each answer should not exceed 600 words.

16. (a) Define the following with example :

(i) Sustainable development (4)

(ii) Reaction selectivity. (4)

Or

(b) Describe the twelve principles of green chemistry.

17. (a) Explain the applications of supercritical CO₂ in organic synthesis.

Or

(b) Summarize the extraction of super critical fluids.

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18. (a) Criticize the role of acid base catalyst in chemical reaction.

Or

(b) Illustrate the importance of green catalyst with any two examples.

19. (a) Apply microwave radiation to carry out the following reaction:

(i) Diels Alder reaction (4)

(ii) Decarboxylation. (4)

Or

(b) Enumerate the following on the basis of green concept.

(i) Hoffmann elimination (4)

(ii) Alkylation. (4)

20. (a) Justify the following statement :

Hydrogen and wind energies are renewable energy sources.

Or

(b) Summarize the importance of green energy.

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