2022/12

SET B

B.SC. CHEMISTRY
FIFTH SEMESTER
GREEN CHEMISTRY
BSC – 505A

[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

(Objective)

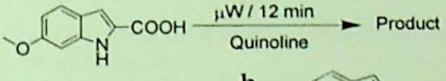
Time: 30 min. **Marks: 20**

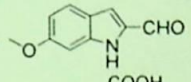
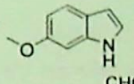
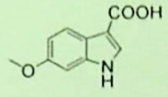
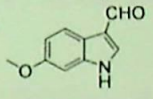
Choose the correct answer from the following: ***1×20=20***

1. Which of the following green method is used to convert benzaldehyde to cyanobenzene?
   a. NBS / μW
   b. NH_3 / μW
   c. $MeNH_2$ / μW
   d. NH_2OH / μW

2. Chemicals that are less hazardous to human health and environment are
   a. Less toxic to organisms
   b. More toxic to organisms
   c. More damaging to environment
   d. More persistent to environment

3. The product formed for the following reaction under green chemical process is



   a. 
   b. 
   c. 
   d. 

4. Green synthesis of methyl methacrylate is of
   a. 100% atom economic process
   b. 90% atom economic process
   c. 80% atom economic process
   d. 70% atom economic process

5. 'KA' oil contains
   a. cyclohexanone & cyclohexanol
   b. hexanone& hexanol
   c. cyclopetanone&cyclopentanol
   d. petanone& pentanol

6. Which one of the following methods is greener than the conventional methods?
   a. Micro waves
   b. Electromagnetic wave
   c. Ultraviolet waves
   d. Radio waves

7. The functional group present in Urethane is called as
   a. ester
   b. amide
   c. carbamate
   d. Carboxylic acid

8. DMC is used as a green chemical
   a. oxidant
   b. selective methylating agent
   c. reducing agent
   d. polymerizing agent

9. The major use of catechol is as
   a. an oxidizing agent
   b. an antioxidant
   c. a reducing agent
   d. A food colouring agent

10. Most suitable starting material for the green synthesis of adipic acid is
   a. cyclohexene
   b. KA oil
   c. fructose
   d. glucose

11. Green chemistry reduces the use of
   a. Liquid fuels
   b. Energy
   c. Gaseous fuels
   d. Solid fuels

12. The diacyl hydrazine derivatives used as insecticide is
   a. Aldrin
   b. Ethyl carbamates
   c. Dieldrin
   d. Tebufenozide

13. Green synthesis of Catechol involves
   a. 2-chlorophenol
   b. 2-aminophenol
   c. D-Glucose
   d. Phenol

14. The reaction which is known to have least atom economy is
   a. addition
   b. elimination
   c. substitution
   d. rearrangement

15. Which of the following method is greener than the conventional methods
   a. X-ray assisted
   b. ultraviolet assisted
   c. γ-ray assisted
   d. Microwave assisted

16. A desirable green solvent should be _____
   a. Costly
   b. Toxic
   c. Readily available
   d. Synthetic

17. The drug which is safer to acetanilide being used as analgesic in the treatment of fever is
   a. Paracetamol
   b. Phthalidomide
   c. Pomalidomide
   d. None of these

18. Green chemistry is the design of chemical products and processes that reduce the use and generation of hazardous substances. The technique used in this area is
   a. Bio-amplification
   b. Polymer manufacturing
   c. Pesticide synthesis
   d. Use of sunlight and microwave-assisted reaction

19. A green oxidation catalyst in presence of H_2O_2 used in the hydroxylation of phenols is
   a. Tungsten silicate
   b. Manganese silicate
   c. Magnesium silicate
   d. Titanium silicates

20. An example of organochlorides insecticide is
   a. Methyl carbamate
   b. DDT
   c. Trimethoxy phosphate
   d. Dimethyl sulphate

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Descriptive

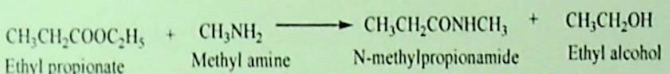
Time : 2 hrs. 30 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. a. Discuss the goals of green chemistry and illustrate its drawbacks. 5

   b. What is BHT? Discuss its importance and green chemical synthesis. 5

2. a. What is atom economy? Calculate the atom economy of the following reaction 5



   b. What are phase transfer catalysts? Give two examples. 3

   c. Distinguish between the terms "Biodegradation" and Bioremediation" 2

3. a. Designing of safer chemicals is considered as one of the principles of green chemistry. Illustrate with suitable examples. 5

   b. Write the structure of DDT and mention its drawbacks. 3

   c. Write the advantages of these carbamates over organochlorides 2

4. a. What are ionic liquids? Give two examples and mention its advantages over conventional liquids. 5

   b. What is multifunctional reagent? Give an example of a reaction with multifunctional reagent and explain. 3

   c. What are green oxidation catalysts? Give two examples. 2

5. a. What is the general structure of Urethane? Why it is important? Discuss its general synthesis and drawbacks of the process. 6

   b. Discuss the green chemical synthesis of methyl methacrylate. 4

6. a. Write a short note on green chemical reactions *via* microwave irradiation. 6

b. Discuss orthoesterclaisen rearrangement reaction in the light of green chemistry 4

7. a. Why Diels-Alder reaction is considered to be a green chemical reaction? Justify your answer. 5

b. Can rearrangement reaction is considered to be a green chemical reaction? Justify your answer. 5

8. a. Write a short note on green chemical reactions *via* ultrasonic methods. 6

b. Why ultrasonic method is considered as one of the green chemical methods? Justify your answer. 4

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