CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN, NUVEM-GOA

SEMESTER END EXAMINATION JANUARY 2022

Semester: V of B.Sc.

Course name & Code: Green Methods and Safety Aspects in Chemistry CHD102

Total marks:80 **Duration: 2 hours** **Total No of pages: 3**

Instructions: *1) Answers to the two sections should be written on separate answer books.*
2) All questions are compulsory
3) Figures to the right indicate full marks
4) For questions 2,3,5 & 6 there is choice for question A

Section A

Q1) Answer **Any four** of the following. **(4 x 4 = 16 marks)**

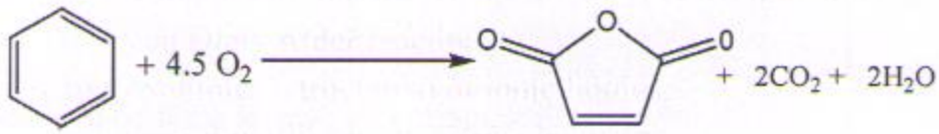
a) Explain in brief any four principles of green chemistry?
b) Explain the green extraction of D-limonene from orange peel.
c) Explain the advantages of microwave heating over conventional heating.
d) Explain the green Diels-Alder reaction.
e) Give any two examples (structures) of ionic liquids.
f) Explain any one real world case in green chemistry.

Q2.A) i) why there is a need for Green Chemistry? **(4 marks)**

ii) what are the environmental problems associated with traditionally used dyes and coloarants? **(2 marks)**

OR

Q2.A) iii) Malaeic Anhydride may be synthesized by the following route: **(4 marks)**



Malaeic Anhydride

Calculate % of atom economy with respect to maleic anhydride.

iv) Give the name as well as the structure of green anti-foulant used. **(2 marks)**

Q2.B) i) Explain the mechanism of PTC in organic reactions. **(4 marks)**

ii) Mention any two green chemistry institutes/organizations in the world. **(2 marks)**

Q3.A) i) Explain the green technique used in aldol condensation reaction between 3,4-dimethoxybenzaldehyde and indanone. **(4 marks)**

Q3.A) iii) Illustrate with examples the role of solid supported reagents in organic reaction. **(4 marks)**

iv) Which surfactant is used for liquid CO_2? How is it prepared? **(2 marks)**

Q3.B) i) Explain the green synthesis of a polylactic acid from corn starch. **(4 marks)**

ii) What do you understand by the term green chemistry? **(2 marks)**

Section B

Q4) Answer **Any four** of the following. **(4 x 4 = 16 marks)**

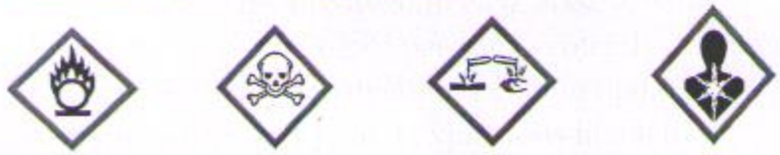
a) What are the steps involved in Risk Assessment?
b) Write a note on doffing of personal protective equipment.
c) What are the steps involved in handling major spills?
d) State the causes of fire and explosions in a lab
e) Give the protocol for disposing of laboratory waste.
f) What care must be taken while selecting and maintaining containers for waste disposal?

Q5.A. i. What are the specifications and requirements of an eye wash station? **(4 marks)**

ii. Define the following a) Toxicity b) Ignitability **(2 marks)**

OR

Q5. A.iii. Interpret the following symbols. **(4 marks)**



A B C D

iv. Give two suggestions on minimizing hazardous wastes. **(2 marks)**

Q5. B. i. What is to be done in case of a minor spill? **(4 marks)**

ii. What does R.A.M.P. stand for? **(2 marks)**

Q6.A. i. How are flammable hazards classified? **(4 marks)**

ii. What care should be taken while disposing of oxidizers? **(2 marks)**

OR

Q6.A.iii. Match the following **(4 marks)**

	A		B

Q6.A.iii. Match the following **(4 marks)**

	A		B
1.	Water and foam extinguisher	a.	Potassium acetate, potassium carbonate, potassium citrate
2.	Clean Agent	b.	Monoammoium Phosphate,Sodium bicarbonate
3.	Dry powder	c.	Tetrafluoroethene,Pentafluoroethene, CO_2
4.	Wet Chemical	d.	Water and fluorinated solvent
			Sodium bicarbonate,potassium bicarbonate, monoammonium phosphate

iv. What care should be taken while disposing of waste containing mercury? **(2 marks)**

Q6.B. i. Write a note on disposal of chromatographic waste. **(4 marks)**

ii. Interpret the following NFPA diamond **(2 marks)**

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