

B.Sc. 5th Semester (Honours) Examination, 2020-2021

CHEMISTRY

Course ID: 51417

Course Code: UG/CHEM/504/DSE-2

Course Title: Green Chemistry

Time: 1 Hour 15 Minutes

Full Marks: 25

The figures in the margin indicate full marks.

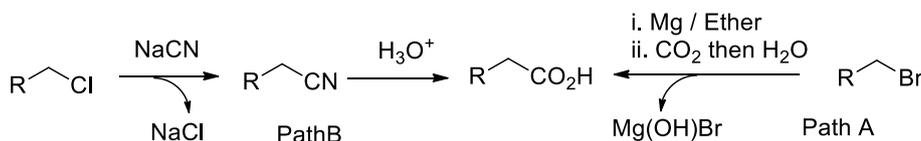
Candidates are required to give their answers in their own words as far as practicable.

1. Answer *any five* questions: 1×5 = 5

- a) Give one principle of green chemistry where toxicity is given priority.
- b) Why Ionic liquids are commonly considered as green solvents?
- c) Which agency demonstrated 12 principles for sustainable development of the environment?
- d) Is microwave radiation an ionizing radiation? Explain.
- e) What is the green alternative for benzoin condensation reaction?
- f) What is the number of virtual compounds to be synthesized theoretically if the numbers of substitutions are 2 and each substituent's with 3 variants?
- g) Give an example of environmentally safe marine antifoulant with trade name.
- h) Give an example of persistent pollutant.

2. Answer *any two* questions: 5×2 = 10

- a) Explain the primary goals of sustainable development. Select the greener process for the preparation of carboxylic acid and discuss which green chemistry principles fit rightly.



2+(2+1) = 5

b) Give one example of surfactant for scCO₂ solvent for cleaning purposes. Why Sea-Nine™ 111 is better marine antifoulant? Which principles satisfy the preparation of silver nanoparticle using tulsi leaves? What do you mean by the marketed biodiesel with B20 label? 1+2+1+1 = 5

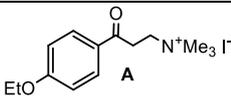
c) i) What is meant by sustainable development? Explain with suitable examples. 2.5+2.5 = 5
 ii) Why ionic liquids are called ‘designer solvent’?

d) i) What are the differences between atom economy and E-Factor?
 ii) Show that atom economy is higher for addition reaction than the elimination reaction. 2+3 = 5

3. Answer *any one* question: 10×1 = 10

a) What is meant by Interesterification process? Between chemical interesterification and enzymatic interesterification – which is better for healthier fat preparation? Explain with example. How analytical techniques used to prevent and minimize the generation of hazardous substances in chemical processes? 2+1+(2+1)+4 = 10

b) i) To carry out Simon-Smith reaction under sonication is far better process than to carry out under conventional condition – Why?
 ii) For the preparation of aryl vinyl ketone from compound ‘A’ which of the two reaction procedures given below is better and why?

<ul style="list-style-type: none"> • Heating A in boiling water. • Heating A under MW-irradiation in water-CHCl₃bi-layer solvent. 	
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iii) Give an example of biodegradable polymer. Write the structure of the monomer.
 iv) What is meant by rightfit pigments? Give two examples of synthetic azo pigments which can replace toxic organic and inorganic pigments.

2+3+2+(1+2) = 10