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**5 SEM TDC DSE CHM (CBCS) 2 (H)**

**2021**

( Held in January/February, 2022 )

CHEMISTRY

( Discipline Specific Elective )

( For Honours )

Paper : DSE–2

**( Green Chemistry )**

*Full Marks* : 53

*Pass Marks* : 21

*Time* : 3 hours

*The figures in the margin indicate full marks for the questions*

**1.** Choose the correct answer : 1×6=6

*(a)* The Bhopal Disaster (1984) was occurred due to

*(i)* methyl cyanide

*(ii)* methyl isocyanide

*(iii)* methyl isocyanate

*(iv)* methyl cyanate

*(b)* The Japanese disease *Itai-Itai* has been attributed to

*(i)* lead poisoning

*(ii)* mercury poisoning

*(iii)* cadmium poisoning

*(iv)* arsenic poisoning

(c) 12 green chemistry principles are postulated by

(i) Professor Paul T. Anastas

(ii) Professor John C. Warner

(iii) Professor Paul T. Anastas and Professor John C. Warner

(iv) Professor John R. Asthana

(d) The formula of adipic acid is

(i) $HOOC—(CH_2)_2—COOH$

(ii) $HOOC—(CH_2)_6—COOH$

(iii) $HOOC—(CH_2)_4—COOH$

(iv) $HOOC—(CH_2)_3—COOH$

(e) Which of the following reactions is an example of microwave-assisted reaction in water?

(i) Hoffmann elimination

(ii) Oxidation of toluene

(iii) Oxidation of alcohol

(iv) All of the above

(f) An efficient, green synthesis of a compostable and widely applicable plastic made from corn is

(i) polylactic acid

(ii) polyacetic acid

(iii) polyvinyl chloride

(iv) polyacrylic acid

2. Answer any *ten* of the following questions : 2×10=20

(a) Explain the term 'green chemistry'.

(b) What are the goals of green chemistry?

(c) Define atom economy.

(d) How can you improve the atom economy of a reaction?

(e) How can you compare the greenness of solvents?

(f) What is chemoselective reaction? Give one example of it.

(g) What is enantioselective reaction? Give one example of it.

(h) Write the reactions involved during the depletion of ozone layer by CFCs.

(i) Write the green approach of synthesis of adipic acid.

(j) Write the alternative approach to Strecker synthesis for the synthesis of disodium iminodiacetate (DSIDA).

(k) Write the greener approach to the Bhopal Gas Tragedy.

(l) What are solid-state reactions? Give one example.

3. Write short notes on any *three* of the following : 3×3=9

(a) Principles of green chemistry

(b) Ionic liquids as green solvents

(c) supercritical carbon dioxide

(d) Protection of a functional group

4. Answer any *three* of the following questions : 3×3=9

(a) Compare the oxidation of toluene and oxidation of alcohols using microwave conditions in water with other conventional procedures.

(b) Compare the Simmons-Smith reaction using ultrasound conditions with other conventional procedures.

(c) How can we design the environmentally safe marine antifoulant?

(d) Write a note on surfactants for carbon dioxide.

5. Answer any *three* of the following questions : 3×3=9

(a) What will be the future trends in green chemistry in the field of oxidative transformations and catalysis?

(b) "Green chemistry is sustainable chemistry." Explain the statement.

(c) What will be the future trends in green chemistry in the field of biominimetic, multifunctional reagents?

(d) What will be the future trends in green chemistry in the field of proliferation of solventless reactions?

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