

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160514****Date:06/06/2022****Subject Name:Green Technology and sustainable Development****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed..

		MARKS
Q.1	(a) Explain the role of chemical engineering in green technology.	03
	(b) Discuss in brief about major challenges for implementing green technology in a chemical industry.	04
	(c) Enlist the twelve principles of green chemistry and discuss them in detail.	07
Q.2	(a) Define ionic liquid with suitable example.	03
	(b) Describe the synthesis of Dimethyl Carbonate as a green reagent in chemical industry.	04
	(c) Explain the importance of Microwave and Ultrasound assisted reactions towards green synthesis. Give example of anyone.	07
	OR	
	(c) Explain the importance of green solvents towards green synthesis with few examples.	07
Q.3	(a) Define process intensification.	03
	(b) Explain the concept of Sustainable Development	04
	(c) Explain the greener approach towards reduction of pollution for polymer and textile industries.	07
	OR	
Q.3	(a) Enlist the three principal dimensions of Sustainable Development.	03
	(b) Explain the concept of green nanotechnology.	04
	(c) Explain the greener approach towards reduction of pollution for pharmaceutical and dyes industries.	07
Q.4	(a) Explain the concept of cleaner production (CP).	03
	(b) Discuss the environmental management hierarchy with reference to cleaner production.	04
	(c) Discuss cleaner production with reference to wastewater minimization in Diethyl Malonate production.	07
	OR	
Q.4	(a) Explain the various barriers and motivators in cleaner production.	03
	(b) Enlist cleaner production tools and discuss their methodology and applications.	04
	(c) Discuss role of cleaner production in survival and sustainable development of chemical industries.	07
Q.5	(a) Discuss in brief the green laws compliance.	03

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| | (b) | Discuss one unit operation in detail which can help create a cleaner product | 04 |
| | (c) | Discuss in detail applications of “Cleaner Production Principles” with special reference to liquid effluent waste minimization for the production of Paracetamol. | 07 |
| | | OR | |
| Q.5 | (a) | Enlist the various responsibilities for action of companies towards cleaner production. | 03 |
| | (b) | Discuss energy conservation as a tool for cleaner production | 04 |
| | (c) | Describe the “Principles of Process Optimization” to achieve Waste Minimization in a plant producing “Vinyl Acetate (VA)”. | 07 |
