

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160514****Date:15-12-2022****Subject Name:Green Technology and sustainable Development****Time:02:30 PM TO 05:00 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) Discuss 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 principles of Green Chemistry. Explain any three in detail.	07
Q.2	(a) Explain the importance of ultrasonic assistant reactions towards green synthesis.	03
	(b) Explain why using reactions with high atom economy is important for sustainable development.	04
	(c) Explain the concept of green nanotechnology with suitable examples.	07
	OR	
	(c) Describe sustainability challenges and possibilities for major technical systems and for their transformation to meet sustainability requirements.	07
Q.3	(a) Discuss the importance of green solvents and give few examples of the same.	03
	(b) Enlist the three principal dimensions of Sustainable Development and explain any one in detail.	04
	(c) Explain the greener approach towards reduction of pollution for pesticides industries.	07
	OR	
Q.3	(a) Explain the importance of microwave assistant reactions towards green synthesis.	03
	(b) Define ionic liquid with suitable examples.	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 barriers and motivators in cleaner production in process industries.	04
	(c) Enlist various cleaner production tools and discuss their working methodology and applications in chemical industries.	07

OR

- Q.4** (a) Discuss the merits and demerits of cleaner production in process industries. **03**
- (b) Explain the environmental management hierarchy. **04**
- (c) Describe the cleaner production with due reference to wastewater minimization in Diethyl Malonate production. **07**

- Q.5** (a) Discuss the relation between CP and EMS. **03**
- (b) Discuss the company's responsibilities to employ the green emerging technologies for sustainable development. **04**
- (c) Illustrate the "Principles of Process Optimization" to achieve Waste Minimization in a plant producing "Vinyl Acetate (VA)" or any other example. **07**

OR

- Q.5** (a) Explain anyone unit operation which can help in producing cleaner product. **03**
- (b) Define Green laws compliance with suitable example. **04**
- (c) Discuss in detail applications of "Cleaner Production Principles" with special reference to liquid effluent waste minimization for the following industrial products: (i) H-acid & (ii) Paracetamol. **07**
