Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– V (New) EXAMINATION – WINTER 2019

Subject Code: 2153611 **Date: 25/11/2019**

Subject Name: Green Chemistry for Technologists

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.**

			MARKS
Q.1	**(a)**	What is atom economy?	**03**
	(b)	How catalysts are considered as green?	**04**
	(c)	Explain twelve basic principles of green chemistry with suitable examples.	**07**
Q.2	**(a)**	Write ways for minimization of pollution.	**03**
	(b)	How green chemistry is different from general chemistry?	**04**
	(c)	Explain utility of water as green solvent in comparison to organic solvents.	**07**
		OR	
	(c)	Explain some chemical hazards occurred and their probable prevention by utilizing green chemistry.	**07**
Q.3	**(a)**	Explain in brief harmful effects of Lead pollution.	**03**
	(b)	What changes can be done via green chemistry for persistent pollutants?	**04**
	(c)	Provide Green Route of Synthesizing the following (a) Epichlorohydrin (b) Propylene Oxide (c) Phenol	**07**
		OR	
Q.3	**(a)**	Give three chemicals that can be generated from renewable sources.	**03**
	(b)	Write suitability for "Green chemistry for green India"	**04**
	(c)	Write in detail the manufacturing involved in Hydrogen Peroxide and also compare both Conventional vs. Green route	**07**
Q.4	**(a)**	What is safer chemical design?	**03**
	(b)	"Microwave heating as a greener technology" Explain.	**04**
	(c)	What are solvent free reactions Explain various ways available with the help of chemical reactions.	**07**
		OR	
Q.4	**(a)**	Write a note on "Process Intensification".	**03**
	(b)	Name few industries which have opted OR in need of opting green chemistry principles?	**04**
	(c)	What are Ionic liquids? Explain properties of ionic liquids and their applications.	**07**
Q.5	**(a)**	What are VOCs?	**03**
	(b)	Explain principle for reduced derivatization.	**04**
	(c)	What are supercritical fluids? What is supercritical CO_2? What are its advantages?	**07**
		OR	
Q.5	**(a)**	Write a note on solvent free organic synthesis.	**03**
	(b)	Explain greener approach of reactions through sonication.	**04**
	(c)	Write in detail Green Route of Synthesizing the following (a) Aniline (b) Ibuprofen.	**07**

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