U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Chemical Engineering **Duration: 3 hrs.**
Course Code: 19CH5DELC2 **Max Marks: 100**
Course: Recycle and Reuse of Waste materials for Sustainable Development **Date: 09.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1	a)	Explain the incineration and landfill processes for treatment of the solid waste.	**10**
	b)	Explain the cradle to cradle concept in the life cycle analysis of the solid waste.	**10**

UNIT - II

2	a)	Explain the term cleaner production and benefits of cleaner production.	**10**
	b)	Discuss the various cleaner production techniques practised in industries.	**10**

OR

3	a)	Explain the cleaner production case study of co-processing of hazardous and non-hazardous wastes as an alternate fuel in cement kiln.	**10**
	b)	Explain the case study of re-use of ETP sludge and dry finish dust in manufacturing process of electrical insulators and reuse of water from sewage treatment plant.	**10**

UNIT - III

4	a)	Explain the process of solid waste reduction at source.	**10**
	b)	Discuss the metals recycling in solid waste management and challenges.	**10**

OR

5	a)	Explain the environmental impacts and benefits of recycling.	**10**
	b)	What are the risks associated with the solid waste management?	**10**

UNIT - IV

6	a)	Explain the implementation of cleaner production techniques for iron and steel industry.	**10**
	b)	Compare the advantages and disadvantages of wet and dry process of the Portland cement manufacturing.	**10**

UNIT - V

7	a)	Explain the market for recyclables.	**10**
	b)	Elucidate on the capital and operating costs of the waste facilities and systems.	**10**

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