

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024**

**Subject Code:3171304**

**Date:11-12-2024**

**Subject Name: Cleaner Production and Waste Utilization**

**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.

- Q.1** (a) What do you mean by Waste minimization? **03**  
(b) Discuss the concept of 4R's. **04**  
(c) Discuss impact of CP on country's economy. **07**
- Q.2** (a) What do you mean by Process flow diagram? **03**  
(b) Differentiate between CP and EMS. **04**  
(c) Discuss six step CP methodology. **07**
- OR**
- (c) Explain the concept of Pollution prevention. **07**
- Q.3** (a) What do you mean by Water balance diagram? **03**  
(b) Differentiate between CP and End-of-pipe approach.. **04**  
(c) Describe Shell & Tube Heat Exchanger with neat sketch. **07**
- OR**
- Q.3** (a) Enlist approaches of industry toward pollution. **03**  
(b) Enlist and explain CP Tools. **04**  
(c) Explain key steps to Energy audit. **07**
- Q.4** (a) Enlist instruments used for Energy audit. **03**  
(b) Explain waste hierarchy. **04**  
(c) Enlist and explain objectives and benefits of Cleaner production. **07**
- OR**
- Q.4** (a) Define LMTD. **03**  
(b) Enlist criteria for CP team selection.. **04**  
(c) Enlist and explain types of Heat exchanger with its application. **07**
- Q.5** (a) What do you mean by Mass balance? **03**  
(b) Discuss techniques for financial analysis of CP. **04**  
(c) Discuss case study of CP implementation in any one industry. **07**
- OR**
- Q.5** (a) What do you mean by Pay back period? **03**  
(b) Discuss the importance of energy balance for CP. **04**  
(c) How to carry out Preliminary or Walk- through Energy audit? **07**

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