

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2171304****Date:25/01/2021****Subject Name:Cleaner Production & Waste Utilization****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

- 1. Attempt any FOUR questions out of EIGHT questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- Q.1(a)** Discuss about the cleaner production concept in brief. **03**
- (b)** Give the difference between concept of recycling and reuse for waste minimization with appropriate example. **04**
- (c)** Make an exhaustive list of various the parallel approaches of CP and explain any two in detail. **07**
- Q.2(a)** Explain the “Hierarchy of CP.” In brief. **03**
- (b)** Make a checklist to implement good housekeeping in any industry. **04**
- (c)** Make a list of various steps to be follow if you want to applied CP methodology in dairy industry. **07**
- Q.3(a)** What are the barriers to the implementation of CP? **03**
- (b)** Explain how good housekeeping is useful in environmental management system. **04**
- (c)** Differentiate between Energy audit and financial audit with respect to CP. **07**
- Q.4(a)** Enlist the objectives of energy audit. **03**
- (b)** Enlist the methods of Energy Audit and explain any one in brief. **04**
- (c)** Write a detail note on “Financial analysis of CP.” **07**
- Q.5(a)** What are the sources of waste heat generated in different types of industries? **03**
- (b)** State the benefits of recycling and reuse of waste with example. **04**
- (c)** Using appropriate example discuss about the recycling of liquid waste in different industries. **07**
- Q.6(a)** Discuss the concept of 4Rs in brief. **03**
- (b)** Explain with neat sketch plate and frame type heat exchanger **04**
- (c)** Write a detail on “Heat Recovery Boiler” **07**

- Q.7(a)** Enlist the benefits of waste heat recovery. **03**
- (b)** Discuss the pros and cons of heat pipe. **04**
- (c)** Enlist the principal steps required for the design of any waste heat recovery exchanger. **07**
- Q.8(a)** Explain the concept of LMTD with temperature profile of parallel & counter flow. **03**
- (b)** Explain the fluid allocation in shell and tube heat exchangers. **04**
- (c)** Give the classification of heat transfer equipments used for chemical process industries based on function. **07**

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