

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3171304****Date:06/06/2022****Subject Name:Cleaner Production and Waste Utilization****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.

- Q.1** (a) Define the term 'Audit'. **03**  
(b) What is the effect of CP on Industrial economy? **04**  
(c) Describe the concept of CP. **07**
- Q.2** (a) Define Cleaner Production. **03**  
(b) How to Analyse process steps? **04**  
(c) Explain six step methodology of CP. **07**
- OR**
- (c) Describe methods to carry out Financial analysis of CP. **07**
- Q.3** (a) Define the term 'Recycling'. **03**  
(b) How to designate CP team? **04**  
(c) Discuss procedure for Energy audit. **07**
- OR**
- Q.3** (a) What do you mean by detailed Energy audit? **03**  
(b) Discuss factors affecting selection of CP solution. **04**  
(c) Describe Walk-through Energy audit. **07**
- Q.4** (a) Define LMTD. **03**  
(b) Enlist types of heat exchangers with their suitability to various applications. **04**  
(c) Discuss one case study of CP implementation in dairy industry. **07**
- OR**
- Q.4** (a) What do you mean by Sustaining CP? **03**  
(b) Discuss the importance of Mass and energy balance. **04**  
(c) Discuss one case study of CP implementation in Pulp and paper industry. **07**
- Q.5** (a) What do you mean by Solid industrial waste? **03**  
(b) Describe Recycling and reuse of liquid industrial waste with one suitable example. **04**  
(c) Discuss Shell & Tube Heat Exchanger with neat sketch. **07**
- OR**
- Q.5** (a) What is Heat exchanger? **03**  
(b) Describe Recycling and reuse of Solid industrial waste with one suitable example. **04**  
(c) Identify the pathways for Waste heat recovery. **07**

\*\*\*\*\*