Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Sem-IV -Examination May 2012

Subject code: 743001
Subject Name: Cleaner Production
Date:12/5/2012 **Time:2.30pm to 5.00pm**
Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

1	How energy audits are conducted? Discuss energy conservation as a tool for cleaner production.	**14**
2 (a)	Explain cleaner production and cleaner technology in brief.	**7**
(b)	Write the steps to be considered for saving energy in waste heat recovery system in a chemical process industry.	**7**
	OR	
(b)	Write the steps to be considered for savings energy in steam system in a Chemical process industry.	**7**
3 (a)	Write steps for cleaner production methodology and discuss them in brief.	**7**
(b)	What is good housekeeping ? What are the benefits of good housekeeping ?	**7**
	OR	
(a)	Discuss process change as 'Source of Waste reduction'.	**7**
(b)	Write the steps to be considered for savings energy in Vacuum systems in a Chemical process industry.	**7**
4 (a)	Give an example of cleaner production in any one chemical process industry.	**7**
(b)	Role of C.P. in survival and sustainable development of Chemical Industries.	**7**
	OR	
(a)	Discuss recycling as cleaner production technique.	**7**
(b)	Explain cleaner production with case study.	**7**
5	The steam pipe carrying steam 205 ^{o} C and 15.82 atm is having damaged insulation due to which heat is lost. Steam flow rate is assumed to be 100 kg./hr.In order to show the benefit of providing insulation as 'CP option' and deriving economic gain, calculate how much money can be saved by providing 5 c.m. thick asbestoses insulation over pipe? ha = 10.7 watt/m^{2o}c, hs= 9.05 watt/m^{2o}c, hc=929.6 watt/m^{2o}c Calorific value of fuel= 4529.25 kj/kg ,λ_{steam} = 2185 kj/kg ,cost of fuel=50 rs./kg	**14**
	OR	
(a)	Explain financial analysis of cleaner production.	**7**
(b)	Discuss the difference between cleaner production and end of pipe treatment.	**7**