

King Fahd University of Petroleum & Minerals
Chemical Engineering Department

CHE 425 - Engineering Economics and Design Principles

(Term 081)
2nd Major Exam.

Name _____

ID # _____

Time allowed: **100 minutes**

Instructor: Dr. Nadhir A. Al-Baghli

Question #	Max. Numbers	Obtained
1	30	
2	25	
3	45	
Total	100	

January 11, 2009

Closed Book

Q1 (30 points)

Define the following terms

Operating Temperature of Special Concern

Operating Pressure of Special Concern

Process Condition Matrix

Operating Cost

Base Conditions for Equipment Cost Evaluation

Grass Roots Costs

CEPCI

Stream Factor

Cooling Tower

Fixed Manufacturing Cost

Q2 (30 points)

Answer the following questions

- a) State at least three reasons to operate a reactor at high temperature.
- b) State some possible justifications and the penalties associated with feeding a reactor with inert materials.

c) State all possible factors that should be considered when evaluating the capital cost of a chemical plant.

d) State all possible factors that should be considered when evaluating the cost of manufacturing of a chemical product.

Open Book

Name:

ID #:

Q3 (50 points)

For the dimethyl ether process shown in Figure B1 (Appendix B) in your textbook:

- a) Construct a process condition matrix and label any equipment operating at conditions of special concern.
- b) Estimate the total module cost of tower T201 (CEPCI = 450 in 2009).
- c) Estimate the number of operating labors and labor cost.
- d) Estimate the cost of raw materials (SF =0.95).
- e) Estimate the cost of utility necessary to run the plant (SF =0.95).