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B. Tech
PECH 7406

Eighth Semester Examination – 2008

PROCESS SIMULATION AND OPTIMIZATION

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory
and any **five** from the rest.

*The figures in the right-hand margin
indicate marks.*

1. Answer the following questions : 2×10
- (a) What is mathematical modeling ?
 - (b) Explain simulation.
 - (c) Define degrees of freedom and what is over specified system.

- (d) Justify why the degree of freedom of a process at dynamic state is equal to or more than those at steady state.
- (e) What is unimodal function ?
- (f) Explain about regula falsi method.
- (g) In which case ordinary differential equation is used ?
- (h) Why the mathematical model for mercury thermometer is ordinary differential equation form ?
 - (i) What do you mean by transport equation ?
 - (j) Why it is so called as flash drum ?

2. What are the uses and principles of formulation in mathematical modeling ? 10
3. Describe the different fundamental laws applicable in formulation of mathematical model. 10



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Contd.

4. Differentiate between lumped and distributed parameter models with suitable examples. 10
5. Describe in detail about computer aided design. 10
6. Develop a mathematical model for single component vaporizer. 10
7. Pressure and composition of the liquids are given P and x respectively. Simulate to find out the bubble temperature for a two component ideal system. 5+5
8. Write short notes on any *two* : 5×2
 - (a) Dichotomous search
 - (b) Golden section method
 - (c) Fibonacci method