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18CH71

Seventh Semester B.E. Degree Examination, July/August 2022

Computer Applications and Modeling

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain Newton-Raphson method for finding the roots of a polynomial. (08 Marks)
- b. Write an algorithm and a C-program for solving an ordinary differential equation, using Runge Kutta 4th order method. (12 Marks)

OR

- 2 a. Discuss a method for curve-fitting. (08 Marks)
- b. Write an algorithm and a program for calculation of mean molal heat capacity. (12 Marks)

Module-2

- 3 a. Define and explain bubble point and dew point. (08 Marks)
- b. Write a C-application program along with flow chart to calculate bubble temperature for an ideal binary mixture. (12 Marks)

OR

- 4 a. Explain an algorithm for flash calculations for multi component system. (08 Marks)
- b. Write an algorithm and a program for design of an adiabatic batch reactor. (12 Marks)

Module-3

- 5 Write an algorithm, flow chart and a program for calculation of area, length and pressure drop for a typical double-pipe-heat-exchanger. (20 Marks)

OR

- 6 Write an algorithm, flow chart and a program for calculation of area, number of tubes and pressure drop for a typical shell and tube heat exchanger. (20 Marks)

Module-4

- 7 Write an algorithm, flow chart and a C-program to determine the number of trays required to produce the distillate and bottom products of required composition from known feed composition and flow rate. The reflux ratio and relative volatility are known. Assume equimolar flow, total condenser and a partial reboiler. (20 Marks)

OR

- 8 Write an algorithm, flow chart and a C-program for absorption in packed column. (20 Marks)

Module-5

- 9 a. Explain principles of mathematical model formulations and its various applications in the field of chemical engineering. (08 Marks)
- b. Develop a mathematical model for batch distillation by listing the necessary data for its development. (12 Marks)

OR

- 10 a. Enumerate in detail, the classification of mathematical models. (08 Marks)
- b. Discuss steady state mathematical model for multicomponent flash drum. (12 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.