

Department of Chemical Engineering

Question Bank

Sub- Modelling And Simulation in Chemical Engineering

Class-B.E Chemical

1.Process simulation requires the following skills:

- a. A sound understanding of engineering fundamentals
- b. modeling skills o computational skills
- c. Both a & b
- d. None of these

2. Model formulation is done based on

- a. the physics of the problem it involved basic laws of conservation of mass, energy and momentum.
- b. Knowledge of respective site.
- c. Understanding of computational skills
- d. All of the above

3. In the lumped parameter systems,

- a.variables are essentially uniform throughout the entire system
- b. variables are varies throughout the entire system
- c. only time variation is considered
- d. none of these

4. Different types of feed arrangement of multiple effect evaporators are

- a. Forward feed arrangement
- b. Backward feed arrangement
- c. Mixed feed arrangement
- e. All of the above

5. mathematical model for cone shaped tank of total volume is $\frac{HR^2}{3} \dots$

- a. $\frac{dh}{dt} + (Kh^2 / R^2) 1/h^{3/2} = F_0 H^2 / R^2 h^2$

- b. $\frac{dh}{dt} + (Kh/R^2)h^{3/2} = F_0H^2/R^2h^2$
- c. $\frac{dh}{dt} + (KH^2/R^2)h^{3/2} = F_0H^2/R^2h^2$
- d. Both a & b

6. Number of dependent variables in Two tank interacting system are

- a. 2
- b. 4
- c. 3
- d. 5

7. One advantage of process simulation is:

- a. It's helpful where mathematical models are not applicable
- b. It can be used to find an optimal solution
- c. Simulation models are cheap to build
- d. None of these

8. Development of simulation models does require..

- a. a good understanding of the system under consideration
- b. some basic knowledge of calculus
- c. both a & b
- d. mathematical and programming expertise.

9. A simulation model uses the mathematical expressions and logical relationships of the

- a. real system.
- b. computer model.
- c. performance measures.
- d. estimated inferences.

10. In order to verify a simulation model

- a. compare results from several simulation languages.
- b. be sure that the procedures for calculations are logically correct.
- c. confirm that the model accurately represents the real system.
- d. run the model long enough to overcome initial start-up results.

11. Which of the following statements is true?

- a. Simulation models are often used for decision making under certainty
- b. Increasing the sample size is the only effective way to reduce the effect of initial conditions.
- c. Uniform probability distributions can either be discrete or continuous.
- d. Random numbers assigned to a probability distribution must be consecutive

12. _____ is the solution of appropriate process material and energy balances.

- a. Flow sheeting
- b. Flow processing
- c. Flow Solving
- d. None of the mentioned

13. Calculation of _____ is the fundamental of flow sheeting codes.

- a. Mass balance
- b. Mole balance
- c. Energy balance
- d. None of the mentioned

14. Which of the following is a feature of process simulator?

- a. Equipment sizing functions
- b. Import and export data
- c. Scheduling of batch operations
- d. All of the mentioned

15. The input mass in a process simulator is X Kg and output mass is Y Kg. Then

- a. $X = Y$
- b. $X > Y$
- c. $X < Y$
- d. None of the mentioned

16.....Is considered to be numerical computational technique used in conjunction with dynamic mathematical model

Select one:

- a. Analysis
- b. None of the above
- c. system simulation
- d. Dynamic computation

17. Question text

A simulation model uses the mathematical expressions and logical relationships of the

Select one:

- a. performance measures.
- b. real system.
- c. computer model
- d. estimated inferences

18. Question text

Engineering design is a _____ process

Select one:

- a. sequential
- b. none of the above

- c. both a & b
- d. iterative

19. Question text

Improving a minimization LP problem means

Select one:

- a. none of these
- b. increasing the optimal objective function value
- c. both a & b
- d. decreasing the optimal objective function value

20. Question text

Simulation models have a number of applications...

Select one:

- a. analyze how the considered system might behave under yet-undocumented conditions.
- b. none of these
- c. allow exploration of the behavior of plant-pathogen systems
- d. both a & b

21. Simulation should be thought of as a technique for

Select one:

- a. Obtaining a relatively inexpensive solution to a problem.
- b. Providing quick and dirty answers to complex problems
- c. Obtaining an optimal solution to a problem.
- d. Increasing one's understanding of a problem

22. Question text

The first step in modelling is to

Select one:

- a. construct a numerical model
- b. Validate the model
- c. Set up possible courses of action for testing.
- d. Define the problem

Question 23

Question text

What are the three major steps involved in decision modeling?

Select one:

- a. Building ? Measuring ? Sensitivity Analysis
- b. Defining ? Testing ? Implementing
- c. Acquiring ? Developing ? Analyzing
- d. Formulation ? Solution ? Interpretation

Question 24

which model follows changes over time that results from the system activities

Select one:

- a. static model
- b. analytical model
- c. numerical model
- d. dynamic model

Question 25

Which of the following are advantages of simulation?

Select one:

- a. Simulation allows "what-if?" type of questions.
- b. Simulation can usually be performed by hand or using a small calculator
- c. (a) and (c) only
- d. Simulation does not interfere with the real-world system

26. Which of the following is a way of imitating a change or event in the world to predict what will happen and why?

Select one:

- a. Science
- b. Law
- c. Model
- d. Simulation

Question 27

Which of the following is an example of a deterministic model?

Select one:

- a. A queuing model
- b. A simulation model
- c. A forecasting model
- d. A linear programming model

Question 28

Which of the following is part of the interpretation step of decision modeling?

Select one:

- a. Testing the solution

- b. Developing a model
- c. Implementing the results
- d. Acquiring input data

Question 29

Which of the following statements is true?

Select one:

- a. A random number is assigned to each value of the random variable.
- b. Simulated results will differ from expected values more for long simulations than for short simulations.
- c. Average values generated from a simulation are generally more accurate than expected values computed from a probability distribution.
- d. Simulation can reproduce the behaviour of a system over several periods.

Question 30

Which of the following statements is true?

Select one:

- a. An algorithm determines how the solution will change with a different model or input data.
- b. Some input data are unknown in probabilistic models.
- c. Solution is the most challenging step in decision modeling.
- d. A variable is a measurable quantity that usually has a known value.

31. Simple distillation is a _____ process

- a. Batch
- b. Continuous
- c. Adiabatic
- d. None of these

32 The real system identifications including

- a. the experimental production factors
- b. specific designed structures
- c. parameters estimation
- d. All of the above

33. distillation column contains a vertical column where trays or plates are used

- a. to enhance the component separations
- b. to provide heat for the necessary vaporization from the bottom of the column
- c. to cool and condense the vapor from the top of the column,
- d. none of these

34. Energy Conservation equation with reaction is..

- a. Accumulation = Input – Output + Generation
- b. Accumulation = Input + Generation
- c. Input = Output
- d. both a and b

35. Dependent variables for Reactors are,

- a. Concentration, temperature, molar flow rate
- b. Concentration, temperature, time
- c. temperature, molar flow rate
- d. temperature, time

36.

Shell side pressure drop in a shell and tube heat exchanger does not depend upon the

- a. baffle spacing & shell diameter.
- b. tube diameter & pitch.

- c. viscosity, density & mass velocity of shell side fluid.
- d. none of these.

37.

The actual temperature drop across the heating surface in an evaporator depends on the

- a. feed.
- b. depth of liquid over heating surface.
- c. pressure difference between steam chest and vapour space.
- e. all of these

38.

Thermal conductivity of a conducting solid material depends upon its

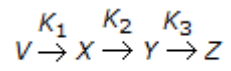
- a. temperature
- b. porosity
- c. both (a) & (b)
- d. neither (a) nor (b)

39,

A backward feed multiple effect evaporator is better than forward feed for concentrating cold feed, because it provides

- a. higher economy
- .b. lower capacity
- c. both (a) & (b)
- d. lower economy

40.



For a reaction of the type, , the rate of reaction ($-r_x$) is given by

- a. $(K_1+K_1)C_X$
- b. $(K_1+K_2+K_3)C_X$
- c. $K_1C_V - K_2C_X$
- d. $(K_1-K_2)C_X$