A

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following is not an Application Areas of Modeling & Simulation?   CO1- U

    (a) Military applications   (b) Designing semiconductors

    (c) Food industry   (d) Telecommunications

2. Which of the following is Step 1 for Developing Simulation Models?   CO1- U

    (a) Design the problem

    (b) Identify the problem

    (c) Collect and start processing the system data

    (d) Develop the model using network diagrams

3. Which of the following is an example of lump system analysis?   CO1- U

    (a) Heating or cooling of fine thermocouple wire due to change in ambient temperature

    (b) Heating of an ingot in an furnace

    (c) Cooling of bars

    (d) Cooling of metal billets in steel works

4. What is the criterion for the applicability of lump system analysis?   CO1- U

    (a) Mean length   (b) Normal length

    (c) Characteristics length   (d) Mass no

5. Transient heat conduction depends upon   CO3- Ana

    (a) Firstly Time and space   (b) Secondly Temperature & time

    (c) Thirdly Time, temperature & space   (d) None of the above

6. Unsteady state heat conduction has temperature variations as   CO3- Ana

    (a) Firstly Periodic   (b) Secondly   Non-periodic

    (c) Thirdly Periodic & non-periodic   (d) None of the above

7. The rate flow in and flow out in an unsteady state process are now increased by 10 Kg/s, which will be the change in accumulation?   CO2- App

    (a) 0   (b) 5 Kg/s   (c) 10 Kg/s   (d) 20 Kg/s

8. An unsteady-state system, with 10 liters as initial amount of water in the vessel, water flow in rate is 8 liters/ s and flow out rate is 5 liters/s, what will be the amount of water in the vessel after 10 seconds?   CO2- App

    (a) 10 liters   (b) 20 liters   (c) 30 liters   (d) 40 liters

9. An unsteady state system, the flow in the rate of A is 12 mole/s, what is the flow out rate of B if the accumulation was 18 moles in 3 seconds?   CO2- App

    (a) 4 mole/s   (b) 6 mole/s   (c) 8 mole/s   (d) 9 mole/s

10. An unsteady state system, the flow in rate of A is 5 mole/s, what is the flow out rate of B if the accumulation was 10 moles in 5 seconds?   CO2- App

    a) 1 mole/s   b) 2 mole/s   c) 3 mole/s   d) 5 mole/s

<div align="center">PART – B (5 x 2= 10Marks)</div>

11. What does "steady state and dynamic" mean?   CO1 -U

12. What is differential partitioning?   CO1 -U

13. Which method is best for solving initial value problems?   CO3- Ana

14. What is the difference between a compressible and incompressible flow?   CO2-App

15. What are the features of hierarchical?   CO1- U

<div align="center">PART – C (5 x 16= 80Marks)</div>

16. (a)   Describe about fundamental laws given below?   CO1 -U   (16)
                         a. Continuity Equations
                        b. Energy Equation

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(b)	Discuss briefly about the Conservation laws and auxiliary relations used in mathematical modeling of chemical process	CO1 -U	(16)

17. (a) Develop the Modeling for a Process Gravity-Flow Tank.?   CO2 -App   (16)

Or

(b) Develop the model for a process - a tank heating system?   CO2 -App   (16)

18. (a) Develop the models of two-phase reactor   CO3- Ana   (16)

Or

(b) Discuss the CSTR with variable holdups   CO3 -Ana   (16)

19. (a) Discuss the Batch distillation with holdup   CO3- Ana   (16)

Or

(b) Derive an expression for mathematical modeling of binary distillation column.   CO3- Ana   (16)

20. (a) Analyze the laminar flow in pipe.   CO4- App   (16)

Or

(b) Construct the mathematical model for semi-batch reactors.   CO4 -App   (16)

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