Total No. of Question : [4]   **Registration No. :** | | | | | | | | |

Programme Name : Bachelor of Chemical Engineering
Regular B.Tech.Final Year (A.Y.2023-24) ESE Sem. VII Nov.2023
VII SEMESTER (2020 BATCH)
201CHL 403-Modeling & Simulation in Chemical Engg.

Duration : [02:00 PM - 04:00 PM]
Date : 28 Nov, 2023
Day : Tuesday

                              Marks : 50

Instructions :
1.Read questions carefully.

(Q1) **All Questions are compulsory**   [20.0]

    (1.1) Explain the general modeling procedure.   [6.0]

        CO :- C403.1
        Blooms Taxonomy :- Understand

    (1.2) How to choose the balance region?   [7.0]

        CO :- C403.2
        Blooms Taxonomy :- Remember

    (1.3) Explain the thermal reactor stability of CSTR.   [7.0]

        CO :- C403.3
        Blooms Taxonomy :- Apply

(Q2) **Attempt any two out of three questions**   [10.0]

    (2.1) Develop a model for batch distillation.   [5.0]

        CO :- C403.4
        Blooms Taxonomy :- Apply

    (2.2) Consider a multi solute batch extraction between immiscible liquid phases. Develop   [5.0]
        the model equation and draw information flow diagram.

        CO :- C403.4
        Blooms Taxonomy :- Apply

    (2.3) Model the Stage wise absorption.   [5.0]

        CO :- C403.4
        Blooms Taxonomy :- Apply

(Q3) **Attempt any two out of three questions** [10.0]

    (3.1) Develop the model equation for gas phase plug flow tubular reactor. [5.0]

        CO :- C403.5
        Blooms Taxonomy :- Apply

    (3.2) Develop the model equations for liquid phase tubular reactor. [5.0]

        CO :- C403.5
        Blooms Taxonomy :- Apply

    (3.3) Consider a steady state single pass shell & tube (counter current) heat exchanger. W [5.0]
        is the mass flow rate, T is temp., Cp is sp. Heat, Th is temp. of hot fluid, Tc is temp. of
        cold fluid. Develop the model equations for cold and hot fluid.

        CO :- C403.5
        Blooms Taxonomy :- Apply

(Q4) **Attempt any two out of three questions** [10.0]

    (4.1) State the steps involved in process simulation. [5.0]

        CO :- C403.6
        Blooms Taxonomy :- Apply

    (4.2) How are the process simulation packages organized? [5.0]

        CO :- C403.6
        Blooms Taxonomy :- Apply

    (4.3) Define Simulation, Process simulation and simulator. [5.0]

        CO :- C403.6
        Blooms Taxonomy :- Apply

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