BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
First Semester 2023-2024

CHE F312 Chemical Engineering Laboratory-I
Date: 03.09.2023, 2–4 PM Mid Semester Examination (Closed Book) Max Marks: 40

List of experiments

1. **Determine the minimum fluidization velocity experimentally as well as theoretically for the flow of air through a fluidized bed.**
2. **Determine the minimum fluidization velocity experimentally as well as theoretically for the flow of water through fluidized bed.**
3. **Experimentally Verify Ergun's equation for flow of air through packed bed.**
4. **Experimentally Verify Ergun's equation for flow of water through packed bed.**
5. **Determine the loss co-efficient for following sections**

   (a) Sudden expansion (b) Tee – junction.
6. **Determine the losses due to friction in pipes and friction factor for Darcy - Weisbach equation (for 1/2 inch SS and GI pipe).**
7. **Experimentally verify the Bernoulli equation for fluid flow in horizontal pipe.**
8. **Determine the co-efficient of discharge through Venturimeter and Orificemeter.**
9. **(a) Determine the critical Reynolds number and the friction factor of water flowing through the helical coil.**

   (b) Determine the critical Reynolds number for liquid flow through a horizontal pipe.
10. **Determine the overall heat transfer coefficient (experimentally and by applying the Dittus-Boelter equation) for counterflow in a double-pipe heat exchanger.**
11. **Determination of the Overall Thermal Conductivity of a Composite wall.**
12. **Experimentally study the operating characteristics of a double acting piston-type reciprocating pump. (Assume zero friction losses between the suction and delivery ports).**
13. **Experimentally study the operating characteristics of a single centrifugal pump. (Assume zero friction losses between the suction and delivery ports).**
14. **Determine the critical moisture content and calculate the total drying time of solids using forced draft condition with cross-circulation drying.**

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