

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2180508****Date: 06/05/2017****Subject Name: Solid-fluid operations(Department Elective - III)****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define: Agitation. Explain different types of agitators in detail. **07**
 (b) Discuss conditions for fluidization in detail. **07**
- Q.2** (a) Explain construction and working of Rotary drum filter with its advantages and limitations. **07**
 (b) Write Short note on ‘Static Mixers’. **07**
- OR**
- (b) A flat blade turbine with six blades is installed centrally in a vertical tank. The tank is 6 ft. in diameter; the turbine is 2 ft. in diameter and is positioned 2 ft. from the bottom of the tank. The turbine blades are 5 inch wide. The tank is filled to a depth of 6 ft. with a solution of caustic soda at 65.6 °C; which has a viscosity of 12 cP and density of 93.5 lb./ft³. The turbine is operated at 90 r/min. The tank is baffled. What power will be required to operate the mixer?
 Data: $N_p = 5.8$ for $69000 < N_{re} < 70000$
 $1 \text{ cP} = 6.72 * 10^{-4} \text{ lb./ft. Sec}$
 $1 \text{ HP} = 550 \text{ ft-lb/sec}$ **07**
- Q.3** (a) Write in detail about types and application of fluidization. **07**
 (b) Write in brief about various solid fluid operations. **07**
- OR**
- Q.3** (a) Write short note on ‘Slurry transport’. **07**
 (b) Explain working of cyclone separator with neat sketch. **07**
- Q.4** (a) Explain ‘sink and float’ method for sorting classifiers. **07**
 (b) Discuss pneumatic conveying system in detail. **07**
- OR**
- Q.4** (a) Classify the equipments for solid conveying. Explain chain conveyor in detail. **07**
 (b) Write in detail about types of nucleation. **07**
- Q.5** (a) Explain the phenomenon of leaching with suitable example. **07**
 (b) Write difference between fluidized bed and fixed bed reactors. **07**
- OR**
- Q.5** (a) Write in brief about slurry reactors with advantages and limitations. **07**
 (b) Discuss batch sedimentation with appropriate sketch. **07**
