

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V • EXAMINATION – SUMMER • 2015

Subject Code: 150502**Date: 05/05/2015****Subject Name: Mechanical Operation****Time: 02.30pm—5.00pm****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) Write a short note on 'Classification of Size Reduction Equipments'. **07**
(b) Draw a neat diagram and explain construction, working, advantages, limitations and applications of rotary drum filter. **07**
- Q.2** (a) With neat diagram explain batch sedimentation test in detail. **07**
(b) Write the statement of Bond's Crushing Law. A continuous grinder obeying Bond's Crushing Law grinds a solid at the rate of 1000Kg/hr from the initial diameter of 10mm to the final diameter of 2mm. If it is required to produce particles of 1 mm size, what would be the output rate of the grinder (in Kg/hr) for the same power input? **07**
- OR**
- (b) Write a short note on 'Pneumatic Conveyor'. **07**
- Q.3** (a) With suitable examples explain applications of fluidization in chemical industries. **07**
(b) A constant pressure filtration unit is operates at 2.5 atm., a filtrate volume of 1500 liters is collected per hour. Washing is done with 500 liters of water. Ideal time required is 2.4 hr, the plant operates 15 hours a day. Neglecting medium resistance, determine volume of filtrate produced in a day. **07**
- OR**
- Q.3** (a) With neat diagram explain construction, working and applications of grizzlies. **07**
(b) Answer the following:
(1) Define: (i) filter aid (ii) filter medium **02**
(2) List out different parameters affecting rate of filtration. **05**
- Q.4** (a) Draw a neat diagram of Cyclone Separator; explain its working and applications. **07**
(b) Enlist various solid mixing equipments and with neat diagram explain construction, working and applications of any one of them in detail. **07**
- OR**
- Q.4** (a) Which methods are used to prevent swirling and vortex formation in an agitated tank? **07**
(b) Write a short note on ball mill. **07**
- Q.5** (a) Write a short note on differential analysis. **07**
(b) Answer the following:
(1) Explain in brief characteristics and applications of propeller. **04**
(2) Write applications of a screw conveyor. **03**
- OR**
- Q.5** (a) Write objectives of agitation in chemical industries. **07**
(b) Answer the following:
(1) Define: (i) sphericity (ii) mesh number. **02**
(2) Discuss five parameters affecting efficiency of screening. **05**