

**GUJARAT TECHNOLOGICAL UNIVERSITY****Diploma Engineering - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 3330502****Date: 27-11-2014****Subject Name: Mechanical Operation****Time: 10:30 am - 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.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** Answer any seven out of ten. **14**
1. Write the basic feature of unit operation
  2. Write the basic feature of unit process
  3. Why the faces of jaw crusher is corrugated
  4. State why centrifuging is not desirable in ball mill
  5. Define mesh number and critical speed of ball mill
  6. why ball mill is lined inside with abrasive resistant material
  7. Write down the principles on which size reduction machines are worked
  8. Define classification and write the name of any one classifier.
  9. Define sedimentation and terminal settling velocity
  10. Why baffles are provided in agitated vessel
- Q.2** (a) Define size reduction and give its importance. **03**
- OR
- (a) Differentiate the open and closed circuit grinding any three points **03**
- (b) Draw the neat sketch of roll crusher and name its parts **03**
- OR
- (b) Explain the ball mill **03**
- (c) Derivation of equation of critical speed of ball mill **04**
- OR
- (c) Explain the axial flow and radial flow impeller **04**
- (d) Write a short note on vibrating screen **04**
- OR
- (d) Give the four characteristics of filter media **04**
- Q.3** (a) Differentiate constant rate filtration and constant pressure filtration **03**
- OR
- (a) Classify the centrifugal equipments **03**
- (b) State the any two size reduction laws **03**
- OR
- (b) Define shape factor and sphericity **03**
- (c) Give the merit and demerit of plate and frame filter press **04**
- OR
- (c) Explain the preventive methods of vortex formation **04**
- (d) Explain the leaf filter **04**
- OR
- (d) Explain the double cone classifier **04**
- Q.4** (a) Define sedimentation, free settling and hindered settling **03**

OR

- (a) Define classification and write the name of classifiers. **03**
- (b) Explain the batch sedimentation test **04**

OR

- (b) Write the any four purposes of agitation **04**
- (c) Derive the formula for effectiveness of screen **07**

- Q.5**
- (a) Draw the figure of mechanical agitated vessel **04**
  - (b) State the various types of impellers and draw the sketch of propeller **04**
  - (c) Write a short note of ribbon blender **03**
  - (d) Explain ban bury mixers **03**

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