

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012****Subject code: 172204****Date: 27/12/2012****Subject Name: Mineral Processing****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) What are the important characteristics of minerals used in their separation . 07
Also mention the techniques employed for each characteristic.
- (b) What is mineral processing. Draw a simplified flowsheet for ore processing. 07
- Q.2** (a) List different types of crushers. Draw a simplified diagram of Blake Jaw 07
Crusher and give factors affecting its operation.
- (b) Derive a relation between critical speed of ball mill and its diameter. The ball 07
diameter can be neglected. **OR**
- (b) What is screening ? Which factors affect the screening efficiency ? Classify 07
different types of industrial screening.
- Q.3** (a) What is comminution & its objectives ? Give different stages of size 07
reduction with size ranges.
- (b) Discuss the factors affecting the operation of grinding mills in brief. What do 07
you understand by 'Open Circuit' & 'Closed Circuit' grinding.
- OR**
- Q.3** (a) What is classification . Draw a chart showing different types of classifiers 07
and explain Hydro cyclone.
- (b) Derive equation showing 'Terminal Velocity' dependence on small spherical 07
particle size & densities of particle & fluid under free settling conditions.
- Q.4** (a) What is Jigging operation ? Draw a diagram of Harz Jig showing different 07
parts and explain its operation.
- (b) Explain in brief 'Dense Media Separation' . Describe different media 07
employed for the operation with examples.
- OR**
- Q.4** (a) What is Thickening (Sedimentation) process ? Draw a simplified diagram 07
showing common features of a conventional thickener (Dorr Thickener)
- Q.4** (b) Define Flotation process ? How do different flotation reagents like Collector, 07
Frother, Activator & Depressant affect flotation process ? Explain in brief.
- Q.5** (a) What is magnetic separation ? List out different minerals responding to 07
magnetic separation.
- (b) Draw schematic diagram of Dry-Drum magnetic separator and explain its 07
operation
- OR**
- Q.5** (a) What is Electrical Separation? Explain High Tension Separator in brief ? 07
- (b) Write short notes (Any Two) 07
- i) Pressure Filters ii) Air classifier iii) Recovery &
Enrichment ratio iv) Bauxite ore processing
