

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III(New) EXAMINATION – SUMMER 2016

Subject Code:2132103**Date:04/06/2016****Subject Name:Mineral Processing****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.

| | | MARKS |
|------------|---|-----------|
| Q.1 | Short Questions | 14 |
| | 1 Define Primary and Secondary Metals. | |
| | 2 Define Ore and Mineral. | |
| | 3 List different types of crushers. | |
| | 4 What is screening ? | |
| | 5 Define Concentrate and Tailing. | |
| | 6 Write different ores/minerals of Iron with chemical composition. | |
| | 7 What is Tenor of ore? | |
| | 8 Define the term liberation. | |
| | 9 What is classification? | |
| | 10 Define washing and sorting. | |
| | 11 What is comminution? | |
| | 12 What is Thickening process? | |
| | 13 What is free settling ratio? | |
| | 14 Give physical and chemical characteristics of Copper. | |
| Q.2 | (a) Explain Locking and unlocking of Minerals and Gangue | 03 |
| | (b) Explain motion of charge in Tumbling mill and derive the equation of critical speed. | 04 |
| | (c) Draw a simplified diagram of Blake Jaw Crusher showing different parts. Which factors affect its operation. | 07 |
| | OR | |
| | (c) Explain Mineral Processing? Draw a simplified flow sheet for the various processes involved in it. | 07 |
| Q.3 | (a) Why in ball mill different size of ball are used? | 03 |
| | (b) What do you understand by 'open circuit' and 'closed circuit' grinding. | 04 |
| | (c) Explain Heavy media separation in brief. | 07 |
| | OR | |
| Q.3 | (a) Which factors affect the screening efficiency ? Classify different types of industrial screening | 03 |
| | (b) What are the purpose of collector, frother, activator and depressant in flotation process? | 04 |
| | (c) Explain about sieve analysis. | 07 |
| Q.4 | (a) Draw a flotation circuit consisting of rougher cells, cleaner cells and scavenger cells. | 03 |
| | (b) Explain importance of liberation in mineral processing. | 04 |
| | (c) Short note Froth Floatation. | 07 |

OR

- Q.4** (a) Derive the equation for free settling as per newton's law. **03**
(b) Discuss about electrostatic separators. **04**
(c) Write short note on operation of Jigging machine. **07**
- Q.5** (a) Derive a relation between critical speed of ball mill and its diameter. The ball diameter could be neglected. **03**
(b) Draw a simplified diagram showing common features of a conventional thickener. **04**
(c) What is high tension separation? Explain briefly. **07**
- OR**
- Q.5** (a) Explain air classifier. **03**
(b) Explain benefits and limitations of flotation and Thickening. **04**
(c) What is magnetic separation? Which are the materials usually separable by magnetic separation. **07**
