B.E. 7th sem Mining Engineering Examination, December 2013

Mineral Beneficiation (MN-702)

Full Marks: 70 **Time: 3 hours**

Question No 1 and 6 is compulsory.
Answer any four questions taking two from each half.

FIRST HALF

~~**Answer question no. 1 and any two from the rest in the First Half**~~

1. a) What do you mean by communition?

   b) Explain different laws of communition.

   c) Explain open and closed circuit crushing.

   d) Draw a functional line diagram of a blake type Jaw crusher showing different components.

   e) Fill up the cumulative overflow (%) and cumulative underflow (%) column in the following table:

Size (mesh)	overflow	Cumulative overflow (%)	Cumulative underflow (%)
60	4.5		
100	13.5		
150	18.0		
200	27.0		
325	37.0		

1+3 +3+3 +5 =15

2. a) Classify crushers with example.

   b) Explain the motion of the charge in a ball mill.

   c) Explain d_{50} Size of a screen with a diagram.

2 + 5 + 3 = 10

3. Deduce the expression for calculating efficiency of a screen. 10

4. a) What is gravity separation process?

   b) Explain the principle of Jigging with suitable diagram.

   c) Explain Plunger Jig with a diagram.

1 +5 +4=10

5. a) Explain the principle of shaking table.

   b) Write the advantages of a high rate thickener with reference to a conventional thickener.

5+5=10

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2ND HALF

6. With neat sketch describe the structure and operation of a hydrocyclone. What is cut point of a cyclone? Write down an algorithm for the optimization of cyclone efficiency. (3+2+3+2+5)

7. What is the difference between free and hindered settling? Deduce the terminal velocity for a mineral particle falling in a liquid column. Show the relation between free settling ratio and hindered settling ratio with example. Explain Full teeter phenomenon. (2+4+2+2)

8. What is the principle of dense media separation? Why it is superior to other gravity processes of separation? What do you understand by autogenous media? Write short note on Norwalt Washer. (2+2+2+4)

9. What is magnetic susceptibility of a mineral? Write short notes on dry belt magnetic separator and magnetic precipitator. (2+4+4)

10. Write down the principle of floatation process. Which facts are being utilized in the floatation process? Write down the role of agitator. (3+4+3)