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**Sixth Semester Examination 2010**  
**Underground Metal Mining (MN604)**  
**Mining Engineering**

Full marks 70

Time : 3 hours

Answer any six questions taking three from each half.

Question No. 1 and 6 is compulsory

First half

1. a. Give three differences between raising and winzing.  
b. Give the advantages and disadvantages of vertical shaft in footwall and vertical shaft in hangwall.  
c. Write short notes on ore bin.  
d. Give four differences between sublevel stoping and shrinkage method of stoping.  
(3+3+5+4)
  
2. A crosscut of 3.2 X 3mts and of 120mts in length has to be driven in hard rock conditions. The work has to be completed in 60 days. Describe the cycle of operation, manpower and time cycle for completing the crosscut.  
(10)
  
3. a. Describe the parts of Alimak raise climber.  
b. A winze of 90 mts. has to be driven through hard rock conditions. Describe the cycle of operations.  
(5+5)
  
4. a. Give three differences between underhand stoping and overhand stoping.  
b. An orebody of 30mts in thickness dipping at 30°-35° has to be worked by breast stoping. Describe the method of working.  
(3+7)
  
5. An orebody of 30-38mts. in thickness, dipping at 60°-65° and having strong Hangwall and Footwall has to be worked by sublevel stoping. Describe the stoping method.  
(10)

Second Half

6. a. What are the parameters considered for selecting a stoping method?  
b. Describe the hydraulic method of filling used in cut and fill stoping.  
c. Discuss the classification of borehole mining based on liquefaction of minerals and orientation of wells in boreholes.  
d. Discuss the inherent characteristics for in situ leaching and leachable minerals with corresponding solvents.  
(5+3+3+4)
7. An orebody of 23-28mts. in thickness, dipping at 50° - 55° degrees and having weak hangwall and footwall is to be worked by cut and fill method of stoping. Describe the method of stoping the orebody.  
(10)
8. Write short notes on:  
a. Square set support  
b. Stope and pillar stoping.  
j  
(5+5)
9. What do you mean by placer deposit? How placer mining is different from solution mining? Enumerate Dredging with a neat sketch.  
(1+2+7)
10. Borehole mining is a surface mining method - Explain. Describe mining by 'borehole extraction\*' with neat sketches, highlighting its conditions of applicability and advantages and disadvantages. Why leaching is considered as the combination of extraction and beneficiation processes?  
(2+6+2)