

**DEPARTMENT OF MINING ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR**

Mid-Spring Semester Examination 2013-14

VII Sem. B. Tech. (Mining)

Date: Time: 2 hrs. Full Marks: 60 No. of Students:

Subject Name : Surface Mining (MI38001)

Answer all Questions [Assume any data, if required, giving reasons for the choice.]

**GROUP A (Full Marks: 40)**

- 1) (a) Describe with necessary sketches different types of deposits that are amenable to surface mining? 06
- (b) An initial mine cut (IMC) is to be made to start a surface mine deploying a 10 m<sup>3</sup> shovel and 120T dumper. Consider that the bench height for operating with the machine under the given site conditions is 15 m. The working gradient for the dumper is 15°. Assume that the slope of the working and the permanent benches is 70°. Explain how the IMC will be worked out and calculate the minimum volume to be excavated to develop the 15 m working bench. 03+06
- (c) Illustrate with necessary sketch the schemes of surface mining for any one of the following deposits: 05
- i. Horizontal or gently dipping deposit
  - ii. Steeply dipping deposit
2. (a) Define the following: 04
- i. Current stripping ratio
  - ii. Break-Even stripping Ratio
  - iii. Economic Stripping Ratio
  - iv. Overall Stripping Ratio
- (b) Draw the cross section along AA for the dragline face shown in Figure 1 04

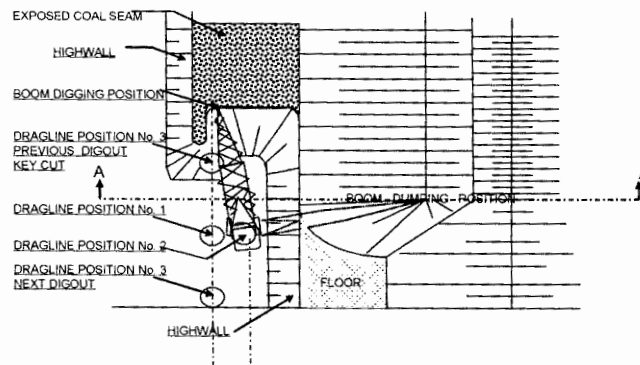


Figure 1  
**OR**

Mention the special features of any one of the following surface mining methods and describe the method with necessary sketches. 02+06

- a. Shovel with In-pit crushers and belt conveyor
- b. Continuous excavation with Bucket Wheel Excavator
- c. Shovel and Truck Mining

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3. (a) What are the deciding factors for selection of technology for site preparation in a surface mine? Explain how you can execute mining with dozer avoiding spillage in dozing operations. 02+04

(b) What are the physical characteristics that favour ripping? What is the best season for ripping? Justify your answer. 04+02

**Group B (Full Marks: 20)**

4. Write a short essay on the present status of surface mining in India. Classify the surface mining systems and give example of each of them. 06+04

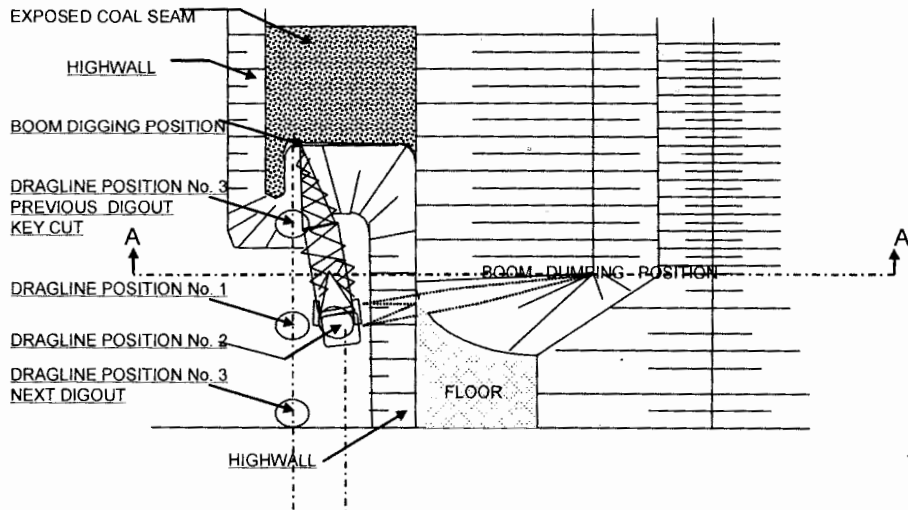
**OR**

What are different phases in the life cycle of a surface mine. Describe them briefly. 04+06

5. "The location and size of the Box Cut affect the development and performance of a surface mine" Explain the statement in the light of issues governing the decision making in selecting the location and size of the box cut. 10

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Answer Sheet for Question No. 2 (b)



**Section A-A**

Name:

Roll No.