

Information on the Exam



General

- **Closed book exam**
- **30 Pages**

1. Introduction

- **Yearly world production of different commodities**
- **Main production areas of different commodities**
- **Feasibility study**
- **Stages in the life of a mine (description, duration)**
- **Resources, Reserves**
- ~~**Reserve estimation**~~

2. Development

- **Definition**
- **Aspects covered by term development (physical dev. + accompanying aspects)**
- **Factors of influence for development**
- **Environmental Impact statement (EIS)**
- **Calculation network technique**
- **Primary openings (Shaft, adit, slope), definitions, basic facts, advantages, disadvantages**
- **Location of main openings: factors of influence**

3. Mining Methods

- **For each mining method:**
 - **Sketches, Design parameters, description**
 - **Sequence of development**
 - **Cycle of operations**
 - **Deposit conditions**
 - **Advantages/Disadvantages**
 - **Relative Costs**
 - **Equipment**
- **Factors in Mining method selection**
- **R&P: Calculation mining losses, Yearly mined area, pillar design**
- **S&P: Differences to R&P**
- **Longwall: Calculation yearly mining area, production rate**
- **Difference sublevel stoping, sublevel caving**
- **Given deposit => possible mining methods**

4. Shaft Sinking

- **Description of all shaft sinking methods**
- **Cycle conventional shaft sinking**
- **Calculation raise bore hole**

5. Road Heading

- **Cycle continuous road heading, calculation of cycle time**
- **Cycle conventional road heading, calculation of cycle time**
- **Comparison continuous road heading, conventional road heading (advantages/disadvantages)**
- **Drilling: calculation drilling rate**

6. Blasting

- **Deflagration, detonation**
- **Components of explosives**
- **Chemical reaction ANFO**
- **Components delay detonator**
- **Types of cuts (sketches)**
- **Blast design (calculation powder factor)**

7. Loading, Hauling, Hoisting

- Calculation capacity of LHD/Truck-system
- Set up belt conveyor
- ~~Comparison LHD/Truck to belt conveyor~~
- ~~Calculation driving force belt conveyor~~

8. Support

- **Types of rock bolts, description, advantages, disadvantages**
- **Support design wedge free to fall, unstable layer**

9. Ventilation

- **Main tasks ventilation**
- **Basic equations (calculation Δp , R)**
- **Axial/radial fan advantages/disadvantages**
- **Ventilation systems for different mining methods (sketches)**

10. Surprise

- **Surprise questions**

Objectives

After completion of this unit you should:

- Know what **underground mining** is about
- Know world **production figures** of mineral commodities
- Know main **production areas**
- Know and be able to explain the **stages in the life of a mine**
- Know the contents of a **feasibility study**
- Know and be able to explain the terms **reserves and resources**
- Know the **cost structure** of a mining project (Capex, Opex)
- Be able to do a **reserve estimation**