

National Exams, May 2003
98-MMP-A5, Mine Management and Systems Analysis

3 hours duration

Notes:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper a clear statement of any assumptions made.
2. Answers need not apply to a particular jurisdiction; rather, full credit will be given for generic answers.
3. Candidates may use one of two calculators, the Casio or Sharp approved model. This is a closed book exam.
4. Any seven questions constitute a complete paper. Only the first seven answers as they appear in your answer book will be marked.
5. All questions are of equal value.

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1. In the current environment of questionable ethical practices in some major corporations, mining companies must properly attend to their ethical and stewardship responsibilities to shareholders, employees, suppliers, customers and the public. Describe how these responsibilities are fulfilled with respect to:
 - ♣ Representation of shareholder interests
 - ♣ Practices regarding insider information and insider trading
 - ♣ Potential conflicts of interest between employees and customers, suppliers and contractors
 - ♣ Occupational health and safety of employees
 - ♣ Public health and environmental protection

2. In the mining industry most operating and maintenance employees and some clerical and technical employees are unionized.
 - ♣ Describe the process whereby a group of employees becomes represented by a union.
 - ♣ How is the scope of the union-management relationship determined?
 - ♣ How is the relationship between managers and individual unionized employees different from the relationship with non-unionized employees?
 - ♣ How are disputes between unionized employees and company managers resolved?

3. Mining companies typically have an integrated system of production planning and budgeting.
 - ♣ Describe the preparation process and the purpose of long range mining plans.
 - ♣ Describe the steps in the preparation of the annual mining plan and budget for a mining operation.
 - ♣ How is the annual mining plan and budget used during the year?

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4. Most capital investment projects in mining must meet objectives for financial return on investment. Describe the following methods for calculating return on investment:
- ♣ Discounted cash flow-Rate of return (DCF-ROR)
 - ♣ Net present value (NPV)
- Describe how payback and sensitivity calculations are used to assess the financial risk of a project.
5. Describe the following project control techniques and the preferred application of each:
- ♣ Program Evaluation and Review Technique (PERT)
 - ♣ Critical Path Method (CPM)
- Describe how change orders and field orders are used by project managers to control project progress and cost.
6. Management is often described as containing the functions of planning, organizing, leading and controlling. Briefly describe each of these functions of management in the context of a mining operation.
7. Incentive (ie. Bonus) plans have historically been an important part of compensation for mine operating employees. Recently, a variety of incentive systems has become a greater part of compensation on a broad basis in the mining industry. Describe the key elements and the application of each of the following types of incentive plan:
- ♣ Piecework
 - ♣ Standard hour
 - ♣ Gainsharing
 - ♣ Profit sharing
 - ♣ Stock option plan
- Describe the role of industrial engineering in the development and application of incentive systems.

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8. Management by objectives might be described as the traditional method of managing employees, whereas Deming's management methods are perhaps adopted more by modern managers. Describe these two methodologies. Point out contrasts between these methods and draw conclusions regarding the effectiveness of each method in mining operations.
9. In the context of a comprehensive accident prevention system for a mining operation, describe the role of each of the following:
- ♣ Orientation and training
 - ♣ Standard operating practices
 - ♣ Skills certification
 - ♣ Accident investigation
 - ♣ Emergency preparedness
10. Describe how business and government organizations interrelate in the exploitation of mineral resources:
- ♣ How do individuals and companies gain access to minerals for the purpose of exploitation?
 - ♣ What is the function of government in mineral tenure?
 - ♣ What is the ongoing role of government in the extraction of minerals?
 - ♣ How are mineral exploitation activities typically financed?