

B. E. Semesters Final Examinations, 2013
7th Semester Mining Engineering

Computer Applications in Mining (MN 704)

Full Marks: 70

Time: 3 hours

Question numbers 1 and 6 are compulsory. Answer another two questions from each half. Figures on the right-hand side margin indicate full marks.

1ST Half

1. The following ~~sketch~~^{table} shows a vertical section of a small block model with the block economic values written on the blocks.

-1	-2	-1	-2	-1	-1	-1	-1
	-2	-2	-2	-1	-2	-1	
		+12	-2	-4	+9		

Given that the pit can be mined to a maximum slope angle of 1 block: 1 block, determine the pit outline with the maximum sum of block economic values, on the section using:

- a) The Positive Moving Cone method.
 - b) A Dynamic Programming formulation.
 - c) Comment on the results obtained in (a) and (b). (6+7+2)
2. a) Enumerate the phase scheduling procedure as per Matheison.
- b) Enumerate the steps for Grade Estimation using Polygonal method. (5+5)
3. a) What do you understand by production scheduling?
- b) Illustrate different scheduling scenarios for the following example:
- 10 ore blocks are overlain by 10 waste blocks
- Net value for an ore block = \$2
- Cost of removing the waste = \$1 per block
- Interest rate = 10%
- Production rate = 5 blocks per year (3+7)
4. a) What is Management Information System?
- b) State the sub-components of MIS?
- c) Compare computer systems with MIS. (2+3+5)
5. Illustrate the Hardy Cross Method of Ventilation Network analysis with example up to two iterations. (11)

~~(MN704)~~

Second Half

~~Answer Question no 6 and any two from the rest~~

6. a) What is resource modeling?

b) What are the basic inputs for resource modeling using a mine planning software?

c) Explain with neat sketches different methods of resource modeling?

(2+2+9)

7. a) What are the basic concepts of use of computer in mining?

b) Explain what are the stages of computer processing in mine planning.

c) Write briefly how geologic database is developed in a mine planning software .

d) What is bench compositing ?

(3+3+2+3)

8 a) Name four mine planning software widely used in the mining industries across the world.

b) Discuss the modules and facilities available in any two of them.

(2+9)

9 a) What are the steps in production planning and scheduling in any mine planning software?

b) What are the steps involved in a mine planning software to assign economic values to different user defined blocks in an ore body?

(5+6)

10 a) What are the data requirements and steps involved in open pit design using a mine planning software ?

b) What are nested pits and why they are created ?

(9+2)