

Mine Manager Examination.

Paper No. 6.

Time allowed, three hours.

The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

LEVELLING.

1. Describe a levelling rod and its use. (15)
2. Describe an engineer's level and its use. (15)
3. Fill in the following level notes, showing the height of instrument and the elevation of each station. Stations are 100 feet apart: (20)

Station	B.S.	H.I.	I.S.	F.S.	Eleva- tion.	Grade.	Re- marks.
	feet.		feet.	feet.	feet.		
0 B.M....	7.50	....	....	....	20.00	....	....
1.....			5.00	....	....	....	....
2.....			2.50	....	....	....	....
3.....			2.00	....	....	....	....
4 T.P....				1.50	....	....	....
.....	8.00	....	....	....	....	....	....
5.....			7.50	....	....	....	....
6.....			6.00	....	....	....	....
7.....			4.00	....	....	....	....
8.....			2.00	....	....	....	....
9.....			2.50	....	....	....	....
10.....			4.00	....	....	....	....
11.....			6.00	....	....	....	....
12.....			4.50	....	....	....	....
13.....			3.50	....	....	....	....
14.....			2.00	....	....	....	....
15 T.P....				0.00	....	....	....
.....	7.50	....	....	....	....	....	....
16.....			8.50	....	....	....	....
17.....			7.00	....	....	....	....
18.....			4.00	....	....	....	....
19.....			2.50	....	....	....	....

4. Draw a profile from the above notes, using a scale of 10 feet to the inch for heights and a scale of 100 feet to the inch for horizontal distances. Mark on the profile the number and elevation of each station. (20)
5. What is the average grade from Station 0 to Station 19? Show grade by line drawn on profile. (15)
6. How would you determine whether your instrument was in proper adjustment? (15)

Mine Manager Examination.

Paper No. 7.

Time allowed, three and one-half hours.

The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

SURVEYING AND MAPPING.

1. On starting to make a survey underground, what instruments, tools and materials are used? State fully how you would proceed to make an underground survey. (10)
2. Why are stations invariably placed in the roof? (10)
3. In setting up a transit, how do you determine the exact place to set the instrument when the point is in the roof? (10)
4. In starting from a true base line OON, you turn an angle to the right 23 degrees 15 min. What is the bearing of this course? On the next station you turn an angle to the right of 87 deg. 10 min. What is the bearing of this course? Is there any way by which these bearings can be checked? (10)
5. A distance measured on a pitch of 35 deg. is 150 feet. What is the horizontal distance? (10)
6. Plot the following survey, reducing angles to corresponding bearings. This survey commences at Sta-

tion O on an established base line which is true north and south, and the readings are as follows: (10)

Station 0-1 Right	31 degrees 15 min.	Dist., 590 feet.
Station 1-2 Right	1 degree 38 min.	Dist., 505 feet.
Station 2-3 Right	127 degrees 04 min.	Dist., 190 feet.
Station 3-4 Right	61 degrees 29 min.	Dist., 102 feet.
Station 4-5 Left	1 degree 58 min.	Dist., 190 feet.
Station 5-6 Left	5 degrees 25 min.	Dist., 600 feet.
Station 6-0		

7. Calculate by sines and cosines the bearing and distance from Station 6 to Station 0. (10)
8. How would you plot the mine workings of a pitching seam on a plan to be used by the pit boss? Give your reasons for such. (10)
9. What is the deflection of the needle in this locality? Why is the needle weighted? (10)
10. Why is it advisable to make a contour map before planning the development of a mine? (10)

Pit Boss Examination.

Paper No. 1.

Time allowed, one and one-half hours.

The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

COAL MINES ACT.

1. What is the interpretation of "pit boss" as laid down by The Coal Mines Act? (5)
2. What are the provisions of The Coal Mines Act regarding an adequate amount of ventilation in a mine? (10)
3. (a) How often does the Act require the air current to be measured? (b) By whom measured? (c) When must the air reports be sent to the office of the Mine Inspector? (10)
4. What does The Coal Mines Act state with regard to the withdrawal of workmen in case of danger? (15)
5. State what dangers are met in approaching old abandoned workings and what precautions are necessary under The Coal Mines Act. (15)
6. What does The Coal Mines Act state about signals and manholes on underground planes which are self-acting or worked by machinery? (10)
7. What are the requirements of The Coal Mines Act regarding manholes on travelling roads where the produce of the mine exceeds 10 tons in one hour? (10)
8. What does The Coal Mines Act state about a person having charge of machinery in a mine where persons are lowered and raised by such machinery? (10)
9. What does The Coal Mines Act state regarding a supply of suitable timber? (10)
10. What are the requirements of the Act regarding the fencing of machinery? (5)

Pit Boss Examination.

Paper No. 2.

Time allowed, two and one-half hours.

The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

VENTILATION.

1. Name the gases met with in mines, giving, also, the symbol and specific gravity of the same. (10)
2. What proportion of atmospheric air and carburetted hydrogen are necessary to form a highly explosive mixture? (10)
3. What are the most common causes of ignition of gases in coal mines? (10)
4. The ventilating fan of a mine is of ample capacity but the ventilation at the face of the workings is insufficient. What would be the probable cause of the fan's inefficiency in producing sufficient air at the face of the