

FOURTH DAY.—TIME: 9 A.M. TO 12 NOON.

SUBJECT I (continued).—*A Knowledge of Underground Surveying, and the Making of Plans of Underground Workings, showing also the Dip or Inclination and Strike of the Reefs or Lodes.*

(f.) State whether the compass can be relied on for underground surveys, and give your reasons for the answer. If you had a choice of a compass or a theodolite, which would you use?

(g.) If you are obliged to make a magnetic underground survey, state what means you would use to check the correctness of the survey, and how you would know that the surface and underground survey are on the same meridian, or how you would reduce them to the same supposing one to be magnetic, the other true.

(h.) From the last station used in the underground survey, calculate the length and bearing of a line drawn thence to any one of the corners of the claim; or a line may be calculated from any one station of the surface survey to any one corner of the claim.

(i.) Describe in writing the adjustments of a plane theodolite and also of a miner's compass. (In both of these subjects the candidate will be examined by the Supervisor, who must furnish a separate report on each candidate's knowledge of the subject.)

(j.) Describe the method of plotting the plan, and how the area of the claim was ascertained, and what instruments were used.

(k.) What are the regulation marks that should define the boundaries of a claim under the Mines Act?

(l.) State where you learnt surveying, and who taught you, and how long you have had practice at surveying.

(m.) What are the sizes of posts required to mark out claims, and their height, according to the Mining Regulations?

FOURTH DAY.—TIME: 2 P.M. TO 5 P.M.

SUBJECT K.—*A Knowledge of Arithmetic and the Method of Keeping Accounts.*

1. What is the square of .0004256? Also give the cube root of same number, and the value of .000329°.

2. If seven men took four days and three hours in doing repairs in a shaft, the men's wages being 9s. per day, how long would it take four men and a boy to do the same work, the men's wages being 8s. per day and the boy's 5s., the boy doing only five-eighths of the quantity of work the men did? Also show the difference in cost.

3. If 414 tons of ore contained by assay 1oz. 3dwt. 4gr. of gold and 2·4dwt. of silver to the ton, and after battery treatment 31·5 per cent. of the gold was recovered and 26·7 per cent. of the silver, and the tailings from the battery were then worked in pans, and 60·4 per cent. of the gold in the tailings were obtained, and 57·1 per cent. of the silver, give the returns in gold and silver from the crushing.

4. If there were twenty-four men employed in a mine at 9s. per day, fifteen men at 8s. per day, and five boys at 5s. per day, and suppose the twenty-four men worked 3 days $4\frac{1}{2}$ hours each, the fifteen men 9 days $3\frac{3}{4}$ hours each, and the boys 11 days $1\frac{1}{2}$ hours each, what would their wages amount to?

5. Give an example of how you would make your entries in the day-book, cash-book, and ledger.

SUBJECT L.—*A Knowledge of Part VI. of "The Mining Act, 1891."*

QUESTIONS USED IN EXAMINATION OF MINING MANAGERS FOR SECOND-CLASS CERTIFICATES.

FIRST DAY.—TIME: 9 A.M. TO 12 NOON.

[Candidates must attempt to answer every question. All calculations to be shown in detail.]

SUBJECT a.—*The Laying-out and Construction of Shafts, Chambers, Main Drives or Levels, Uprises and Stopes.*

1. In laying out the position of a vertical shaft to work a lode dipping at an inclination of 60° eastward, if the outcrop of the lode was seen on the surface, state where you would sink the shaft in relation to the lode, giving your reasons fully.

2. In sinking an inclined shaft, what provision would you make for raising the excavated material to the surface, and what appliances would you use?

3. Give the dimensions of a main level or drive for a double line of rails, and also the dimensions of a chamber you would construct if there were sixty men employed in each shift below ground?

4. What is meant by a "pass"? What is its use, and how would you construct one?

5. If a quartz lode were dipping at an angle of 55°, and you were to sink a vertical shaft on the outcrop of the lode on the surface to a depth of 600ft., what distance would you have to drive from the bottom of the shaft to cut the lode?

SUBJECT c.—*On the Ventilation of Mines.*

1. What is meant by "ventilation"? Why is it required?

2. What gases are found in quartz mines? Give their composition, and state how you would detect their presence in a mine?

3. How is ventilation produced—(a) by natural means, (b) by mechanical means? State fully how you would produce it by both systems.

4. How would you ascertain when the air in a mine is deleterious and unfit for workmen to be employed therein?