

Subject 8.—The effect that faults, slides, and mullock-bars have on lodes, and how to ascertain the direction of slides and heavals :—

(a.) In driving on a lode or reef which strikes N.E. and dips 45° to N.W., it is found to be cut off by a fault that has an underlie of 45° due W. How would you proceed to recover the lode? Explain your theory fully, with diagrams, plan, and sections.

(b.) Country rock of alternate beds of slate and sandstone, and prevailing S.E. dip, carries N.-and-S. vertical lodes, in which the ore runs in bunches or shoots. Explain the probable reason for this, giving diagram, plan, and sections.

THIRD DAY (9 a.m. to 12 noon).

Subject 9.—A knowledge of underground surveying and of making plans of the underground workings, showing the dip or inclination and strike of the reefs or lodes :—

(a.) The candidate must produce a plan showing the surface boundaries of a mining claim of at least twenty acres in extent, and also show (in different-coloured ink) the underground workings, with all traverse-lines, &c., to illustrate the method of survey adopted. Such plan and survey to be the actual work of the candidate.

(b.) Draw a diagram showing how the underground traverses have been connected with the surface traverses, and describe in writing the method adopted for so doing, and describe the apparatus used.

(c.) Produce the original field-book of the work, and also the tabulations showing the closure of the traverses, and the calculation of the distances on meridian and perpendicular.

(d.) From the two points which are farthest apart in the underground survey, calculate the bearing and distance these two points are from one another, and show the calculations.

(e.) Describe the method of obtaining the meridian used in the bearings of both surface and underground survey.

(f.) Describe the method by which the survey has been made, name the instruments used to obtain measurements and angles, and say how the measurements have been reduced to the horizontal.

(g.) What means were taken to insure the accuracy of the measuring-tape, chain, or whatever else was used?

(2 p.m. to 5 p.m.)

Subject 9 (continued) :—

(h.) In a case where magnetic bearings have been used, describe how the differences between the surface and underground meridians are obtained.

(i.) Describe the adjustments of a plane theodolite, and also describe a miner's dial, in writing. [The candidate will also be examined orally in the adjustments and use of these instruments.]

(j.) In a case where there are two adits, describe the method of obtaining the underground meridian, and its connection with the surface meridian.

(k.) Describe how the traverses on which the plan is based were plotted, and also the method by which the offsets were put in.

(l.) What is the area of a figure which is 1,040ft. long, 20ft. wide at one end and 280ft. at the other at right-angles to the line of 1,040ft.?

(m.) What is the area of a triangle 640ft. long in the base and 400ft. long on the perpendicular?

FOURTH DAY (9 a.m. to 12 noon).

Subject 10.—A knowledge of the different rocks where gold, silver, tin, copper, zinc, lead, and antimony are found, and of the formation of lodes and leads :—

(a.) What is the mineral nature of serpentine rock, and what rocks and metallic ores are usually associated with it? Give New Zealand examples.

(b.) In what rock-formations would you expect to find ores of the following metals: Silver, lead, tin, copper, zinc, antimony, manganese, chrome, and tungsten? Give New Zealand examples and localities.

(c.) Describe the different modes in which quartz occurs in veins or otherwise, and the formations in which it is likely to be auriferous to a payable degree.

*Subject 11.**—A knowledge of arithmetic and the methods of keeping accounts :—

(a.) The diameter of a circle is 8ft. : what is its (1) circumference, (2) area?

(b.) Find the square root of 4651904.

(c.) Multiply 84.79 by 88090.

(d.) Find the cost of 13 score 14 tubs, each tub containing $8\frac{1}{2}$ cwt., 20 tubs to one score, at 13s. 4d. per score of 8 tons.

(e.) The tonnage price at a colliery was 5s. ; subsequently 15 per cent. was given, then 15 per cent. reduction : what was the final rate? Afterwards it was agreed that in every ton 1cwt. should be deducted for slack, for which only 9d. per ton should be paid : what was the price per ton of the men's output?

(f.) What is the area of an airway measuring 4ft. 3in. by 3ft. 9in.?

(g.) Under what heads should a cost-sheet at a colliery be divided? Give an illustration.

Subject 12.—A knowledge of "The Mining Act, 1886."

QUESTIONS TO BE USED IN EXAMINATION OF MINING MANAGERS FOR CERTIFICATES OF COMPETENCY UNDER "THE COAL-MINES ACT, 1886."

FIRST DAY (9 a.m. to 12 noon).

Subject 1.—On the sinking of shafts and construction of main roadways, opening out a mine, and the division of a mine into districts :—

* In all cases give the details of your calculations.