

3. A seam of coal dips at the rate of 4in. to the yard to a 10ft. slip, and continues to dip at the same rate on the other side of the trouble: how far will drive have to go, dipping 6in. to the yard, to cut the coal?

4. In driving against a fault, how would you ascertain whether it is a downthrow or upthrow, and the amount of displacement?

FOURTH DAY.—TIME: 9 A.M. TO 12 NOON.

SUBJECT 14.—*A Knowledge of Surface and Underground Surveying, and of making Plans showing System of Working, Inclination of Seams, Faults, and Course of Ventilation.*

1. Candidate must produce plan showing the system of working in a colliery with the surface taken up for at least 20 acres in the vicinity of the shaft, and the underground workings in different-coloured ink. He must describe how he would connect them with the surface in the event of there being only one shaft. The levels and main headways must have assumed traverse calculated in detail, and showing latitude and departure for each bearing.

2. Explain the process of loose-needle surveying, and state what precautions must be taken to avoid error. Show how the survey is booked.

3. How would you proceed in surveying with the fixed needle? and describe the process of plotting same.

4. Sketch on paper as near as you can the following bearings of a survey: (1) N. 82 E., 63 links; (2) S. 51 E., 79 links; (3) N. 20 E., 97 links; (4) N. 37 W., 87 links.

SUBJECT 15.—*A Knowledge of Arithmetic, and Method of keeping Accounts.*

1. How many gallons are there in 16 tons of water, taking the weight of one gallon at 10lb.?

2. Subtract £674 11s. 8d. from £856 9s. 3d., and divide the remainder by 6.

3. What is the difference in area of two 6in. pipes and one 12in.?

4. What weight of material will have to be raised in sinking a shaft 15ft. diameter and 450ft. deep, supposing the material to average 130lb. per cubic foot?

5. Extract the square root of 119,550,669,121.

6. Add together 1,371 tons 2qrs., 749 tons 3cwt. 3qrs., 18,321 tons 3qrs.; 1,146 tons 19cwt., 27 tons 1cwt. 3qrs.

FOURTH DAY.—TIME: 2 P.M. TO 5 P.M.

SUBJECT 16.—*A Knowledge of the Character of the Different Classes of Coal, and also of the Character of the Rocks and Formation of Country where Coal is likely to be found.*

1. In which geological group is coal generally found?

2. State the generally received opinion as to how coal has been formed.

3. State the specific gravity and chemical composition of coal.

4. Give a section, showing the different seams of coal, and say what is the thickness and structure of the coal-measures in your district.

5. Enumerate the various sorts of coal and their appearance and uses.

SUBJECT 17.—*A Knowledge of the Provisions of "The Coal-mines Act, 1891."*

Oral Examination:—

1. Describe the provisions of the Coal-mines Regulation Act—(1) With regard to ventilation; (2) with regard to reporting accidents; (3) with regard to shaft-signals; (4) inspection of shafts; (5) inspection of machinery.

2. What are the principal points to be observed in the management of a fiery mine to comply with Coal-mines Regulation Act, inspection, fixed stations, use of explosives, &c.? Enumerate all the requirements of the Act with regard to survey and plans.

3. What are the provisions of the Act with regard to fencing abandoned workings, providing refuge-holes, providing second outlet, timbering of roads and places, setting of sprags while undercutting, approaching old workings?

QUESTIONS USED IN EXAMINATION OF BATTERY SUPERINTENDENTS FOR CERTIFICATES.

("The Mining Act Amendment Act, 1894.")

FIRST DAY.—TIME: 9 A.M. TO 1 P.M.

[The candidates will not be allowed any books other than logarithm tables during the time they are sitting for examination. They must attempt to answer every question, and all calculations must be shown in detail.]

SUBJECT A.—*The Different Modes of Reducing and Pulverising Ores.*

1. What is meant by rock-breakers, and how are they applied to crush auriferous and argentiferous ores? Show by sketch the different classes of rock-breakers you are acquainted with, and describe their action.

2. Give a full description of a modern stamp-mill for crushing auriferous or argentiferous ores, and all appliances in connection therewith for saving the gold and silver.

3. Show by sketch what is known as the Homestake mortar-box, giving its dimensions, and show how you would fasten copper plates inside the box for the purpose of saving the gold.