

the relation which should be maintained between finished work in the two seams.

4—What precautions would you adopt for reducing as far as possible, accidents from—

- (a) Fall of roof at the face?
- (b) From fire damp?
- (c) Use of explosives?

5—Describe how you would proceed to seal off a gob fire in a section containing ten bords—fire precautions would you take to prevent accidents during operations where fire damp is being given off in the section affected?

6—Describe in a general way, arrangements both on surface and underground, for a shaft 600 ft., with daily output 1,000 tons, 10 hours hoisting—show by sketch. Safety lamps are to be used exclusively. Give details as to working force, duties, etc., for mine work on economical basis.

7—What precautions and care should be taken of steel drawing ropes, when in use, to prevent accidents and specify for the different grades of steel, giving your reasons?

8—What construction of screen would you adopt to prevent breakage in tender coal?

(Note—Candidate may take for illustration any seam with which he may be familiar).

#### —MECHANICS.—

Time—Two Hours.

1—Sketch and describe the action of a double act pump.

2—What head of water will be required to feed direct into a boiler with a steam pressure of 60 lbs. per square inch?

3—What advantages are gained by using a double instead of a single acting hoisting engine?

4—How would you take care of a boiler, re firing, foaming, blowing off water and filling up?

5—What are the uses of fly wheels, and what precautions must be taken in their construction?

6—What weight would a pair of 22 inch cylinder horizontal engines,  $4\frac{1}{2}$  ft. stroke, with an 8 ft. drum, on the first motion, raise from a pit 260 yards deep with a round wire rope, the uniform boiler pressure, 60 lbs. per square inch, the engine to work expansively and the steam cut off at three-quarter stroke?

7—What is a steam engine and the principle of its action, condensing and non-condensing?

8—What do you understand by H. P. in calculating the power of a steam engine?

9—State the various methods of raising water from mines. Describe the safest and most approved kinds of pumping engines.

10—How should you inspect or instruct others to inspect shafts, cages, ropes, etc., used by workmen ascending and descending shaft?

AMBULANCE.—Manager, U. Manager, and Overman.

Time—Half Hour.

1—What course would you pursue to relieve pain in removing to surface a man with fracture of bone.

2—What means would you employ to resuscitate a man who has been overcome by gas in a mine?

#### —SCHOLARSHIP.—

Time—Two and a half hours.

1—What is the number of feet, board measure, in a tapered piece of plank, 20 ft. long, 24 inches wide at one end and 16 inches wide at the other, the board being 2 inches thick?

2—Find the amount and compound interest of \$1,000.00 for 4 years at  $3\frac{1}{2}\%$ .

3—Find the cube root of .5 to 4 places of decimals. 4—A body falls approximately 16 ft. in the second and in each succeeding second 32 ft. more than in the preceding one. How far will it fall in 20 seconds and what distance will it fall in the last second?

5—If three men can do  $\frac{5}{12}$  of a piece of work in 5 days, of 12 hours each, how many men will it take to do  $\frac{4}{9}$  of the work in 6 days, of 8 hours each?

6—Draw a trapezoid having its parallel sides 5 miles and 3 miles respectively, and its altitude 4 miles. What is the combined length of the four sides?

7—What is the cost of tiling a cellar floor 24 ft. 6 inches by 20 ft. 8 inches, size of tile 5 inches by 8 in., tiles worth 30 cents a dozen?

8—Two seams of coal, dipping 1 in 14, are bored through a distance of 50 ft. What must the least distance be of a level to connect seams? Show by sketch that you understand the question.

9—A railway cut 600 feet long, an average depth of 4 ft. 6 inches, bottom of cut 12 ft. wide, sides sloped to an angle of 45 degrees. What is the number of cubic yards of material moved?

10—An equilateral triangle is 10 ft. long on each side and has an area of 43.30. How long should be the side of an equilateral triangle to contain three times the area?

A new briquetting machine called 'Devillers' is working successfully in Brooklyn, N. Y. The machine has turned out 15,000 tons so far this year, all of the product finding ready market. The cost of production is said to be 2.25 to 2.50 per ton. It is mentioned in the Coal Trade Journal that Mr. Deviller is under contract to build a plant in Nova Scotia capable of producing 200 tons per day. This is certainly a big plant, and unless it be at Springhill, we cannot imagine where such a plant can be a success financially, that is, if the manufacture of the briquettes is to cost \$2.50 per ton, and a short ton presumably at that.

The Mining Society, and individuals interested in mining were busy preparing a warm reception for Minister Templeman, when the disappointing intelligence was communicated to them that the visit had been declared off for the present. It is hinted that the large programme prepared to be laid before the minister, as outlined in the Record of a late date gave the minister chills, or at least caused him to take cold feet and defer the visit to N. S. to a more convenient season. If he comes in the fall it will be all the better. There will be ever so many more problems to present to him for solution.