

5. If 9,147 tons cost £2,947 2s. 6d., what is the cost per ton in price and decimals?
6. Describe the provisions of the Coal-mines Act with regard to—
  1. Ventilation.
  2. Shaft signals.
  3. Refuge holes.
  4. Machinery.
  5. Abandoned workings.
  6. Shafts.
7. What is the duty of a manager as regards ventilation, and what is the minimum quantity of air circulated per man and horse allowed in non-fiery mines?

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

SUBJECT No. 1.—*Prospecting, Shaft-sinking, Tunnelling, and opening out a Colliery.*

1. In prospecting a new field for coal, give a short account how you would proceed.
2. Describe the necessary fittings for starting a new shaft, and explain the operation of sinking to the stone head.
3. How would you proceed to open up a coalfield, seam 6 ft. thick, by a dip incline 1 in 6, length 600 yds., and deal with 100 gallons of water per minute?
4. State how you would set timber in a drawing-road—
  - (a.) With soft roof and strong sides and floor;
  - (b.) With good roof and weak sides and floor;
  - (c.) With weak roof and floor and good sides.

SUBJECT No. 2.—*On working Coal and Timbering underground.*

1. Describe in detail the system of working coal with which you are best acquainted, giving section of the coal, nature of roof and bottom, and dip of strata.
2. Describe under what circumstances you would use cogs or chocks in underground workings.
3. Supposing the bars of main road, with very rotten roof, had to be withdrawn: what orders would you give men as to safety in carrying out this work?
4. Show by sketch, and describe, the manner in which you would lay out a district in a mine to employ 30 hewers.

SUBJECT No. 3.—*On Gases in Mines, Spontaneous Combustion, and Ventilation.*

1. Enumerate the gases met with in coal-mines. How can you detect them? State the characteristics of each.
2. What do the rules require a fireman to do if he finds firedamp in a working-face: (a) If he removes it; (b) if he does not remove it; (c) if it accumulates during the working?
3. State your opinion as to spontaneous combustion in mines, and how you would deal with underground fires.
4. Give your opinion as to the relative merits of fan and furnace ventilation, and indicate conditions under which each is preferable.

SUBJECT No. 4.—*On dealing with Old Workings and other Sources of Danger.*

1. In approaching workings known to resist water, what precautions would you adopt?
2. Sketch form of dam suitable to contain a head of 150 ft. of water; materials you would use, and what are the conditions you would try to secure in the site where dam was fixed?
3. What are the causes of blown-out shots, and the danger from them? and what precaution would you take to prevent them?
4. What would you do in case of an accumulation of gas in mine when the men are at work?

SUBJECT No. 5.—*Mine Drainage, Haulage, and Appliances for same.*

1. Describe a force-pump and a siphon. Where can a siphon be used to advantage?
2. Describe a lifting set of pumps; and state how much water can be raised by such a pump 9 in. diameter, 6 ft. stroke, making 10 strokes per minute.
3. On an incline having a grade of 1 in 4 and 20 chains long it is required to lower 12 tubs in a race or set, each tub containing 10 cwt. of coal, empty tubs weighing 5 cwt.: give particulars of class of drum, size of rope, and general arrangements of incline.
4. Give a description of any mechanical underground haulage you are acquainted with.

SUBJECT No. 6.—*Arithmetic, and a Knowledge of "The Coal-mines Act, 1891."*

1. Subtract—

Tons	cwt.	qr.	lb.	Acres	roods	poles
3,927	17	3	15	5,430	2	21
2,198	14	1	16	4,910	3	31

2. Multiply £61,760 2s. 3½d. by 17.

3. If 6 cwt. of small coal are screened out of every ton of coal raised at a colliery, what is the percentage of large and small coal?

4. What are the provisions of the Coal-mines Act as to the following?—

- (a.) Report-books, when and where kept;
- (b.) Under-Manager's duties;
- (c.) Fireman's duties;
- (d.) Employment of boys underground;
- (e.) Withdrawal of workmen;
- (f.) Signalling;
- (g.) Man-holes in haulage and horse-roads.