

SUBJECT 4.—*Dealing with Old Workings and other Sources of Danger.*

1. What precautions would you take in approaching old workings which may contain gas and water under high pressure?
2. If there were indications of creep over a section of the workings, how would you proceed to check it and secure safety to the miners?
3. What provision would you make to guard against fires in a dry and dusty mine in which naked lights are used?
4. What measures would you adopt to guard against blown-out shots, and what great danger is to be apprehended from such shots?
5. What explosives would you use, and what regulations would you enforce, when firing shots in a seam of coal that gives off explosive gas and is dusty also?
6. What is the effect of sediment, or incrustation, forming in a steam-boiler, and what damage is likely to result therefrom?

SUBJECT 5.—*Mine Drainage and Haulage, and Appliances for same.*

1. Explain the action and working of a ram pump, and mention some of the advantages attaching to its use.
2. Describe the various motive powers for driving pumps underground, and explain the method of their application.
3. What is the difference between the main- and tail-rope system and the endless-rope system of haulage? Give a sketch showing an arrangement for taking up slack rope in connection with the latter system.
4. Sketch and describe types of automatic points and self-acting chocks for self-acting inclines.
5. Describe, and show by sketch, the appliances you would erect to lower 300 tons of coal in eight hours down an incline 12 chains long, with a grade of 1 in 6.

SUBJECT 6.—*Practical Elementary Electricity.*

1. Enumerate the various applications of electricity to mining.
2. Explain, as detailed as you can, a chemical battery, such as is used for producing electricity for signalling purposes.
3. Describe the application of electricity to shot-firing.
4. What do you understand by the terms "volt" and "ampere"?

SUBJECT 7.—*Arithmetic, and a Knowledge of "The Coal-mines Act, 1908," and its Amendments; also, First Aid to the Injured.*

1. For a fortnight's work two men get 165 tons 10 cwt. at 1s. 11d. per ton, $12\frac{1}{4}$ yards at 4s. per yard, and truck ninety-eight tubs at 2s. 9d. per score: what amount is due to them?
2. How many bricks would be required to put in twelve stoppings 9 in. thick, average size of each opening 9 ft. by 6 ft.?
3. An airway is half a mile long, 7 ft. high, and 10 ft. wide: what is the rubbing-surface in square feet?
4. How many gallons will a water-tank hold whose diameter is 4 ft. and depth 8 ft.?
5. How many 7-yard rails, weighing 30 lb. to the yard, would it take to lay a double tramway in a main road 1 mile 2 ch. 16 yd. long, and what would be the cost of rails at £8 per ton?
6. Briefly state the requirements of the Coal-mines Act and amendments as to—
 - (a.) Ventilation.
 - (b.) Examination of mine.
 - (c.) Mines liable to flood.
 - (d.) Signalling.
 - (e.) Securing of shafts.
 - (f.) Gunpowder and blasting.

First Aid.

1. What experience have you had in ambulance-work?
2. How would you render first aid to a workman with a compound fracture of a leg?
3. How would you treat a person with injured hand, the fingers cut and bleeding profusely?
4. What treatment would you give a workman scalded by steam?