

8. How would you test sump solutions to ascertain what they contain in gold and silver?
9. If a vat was 23ft. in diameter, and filled with ore to a depth of 3ft. 8in., how many tons of ore would it contain? Also give the weight of solution occupying 14in. in the vat.
10. If there were 85 per cent. of fine gold and 15 per cent. of coarse gold in the ore under treatment with KCN solutions, how would you recover the coarse gold not affected to any appreciable extent by the KCN solution?
11. How many tons of a 0.55-per-cent. KCN solution would be required to make up a 0.3-per-cent. solution, using a 0.08-per-cent. solution for dilution?
12. How many tons of 0.25-per-cent. KCN solution can be obtained from 12 tons of 0.9-per-cent. solution, using a sump solution of 0.11 per cent. for dilution?
13. What per cent. of cyanide potassium would be absorbed in treating ores containing 1oz. free gold and 3oz. silver to the ton?
14. Describe how you would make silver-nitrate solutions.
15. If 9,000lb. of wash-water contained 0.06 per cent. of KCN, how many pounds of KCN would be required to make it up to a 0.45-per-cent. solution, supposing that you were using crude KCN salt containing 79 per cent. KCN?
16. What effect has acids on KCN solutions? What chemical would you use to neutralise ore containing acids?
17. In case of cyanide poisoning, what antidote would you use?

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SECOND DAY.—TIME : 2 P.M. TO 5 P.M.

SUBJECT F.—*Sampling and Testing of Ores.*

1. How would you detect and estimate copper in its ores?
2. What are the tests for tin as in tin-ore?
3. Describe the easier tests for arsenic.
4. How would you test for silver and determine this metal by the wet way, also the dry way?
5. What are the tests usually applied for identifying chromic oxide in chromite?
6. Give the characteristic tests for lead and mercury.
7. State how you would determine the gold in quartzose tailings containing 20 per cent. of iron-pyrites.
8. What are the tests for antimony in stibnite?
9. How would you determine the silver in galena?

SUBJECT G.—*Knowledge of Arithmetic and Method of keeping Accounts.*

1. Divide 0.63456 by 0.793, and extract the cube root of the quotient.
2. If 2oz. 16dwt. of gold of 24 carats was worth £4 3s. 11d. per ounce, what would be the value of the same weight of gold if it were 18.9 carats?
3. If ore assays before treatment 3oz. 5dwt. 4gr. gold and 12oz. 14dwt. 5gr. silver per ton, and the gangue assays after treatment 6dwt. 6gr. gold and 2oz. 3dwt. 15gr. silver, what percentage would be saved; also show the value of the bullion recovered from 30 tons of ore, taking the gold at £4 per oz. and silver at 2s. per oz.?
4. If four men and two boys took 3 days 7 hours to do a certain piece of work, how long would it take five men and three boys to do the same amount of work, taking a boy to do three-eighths the work of a man?
5. A kauri log is 25ft. long, 6ft. 3in. diameter at one end, and 5ft. 9in. diameter at the other, how many cubic feet does it contain?
6. If the wall of a building was 20ft. high, and required a ladder to reach the top of the wall and to cross a ditch 9ft. from the base, what length of a ladder would you require?

SUBJECT H.—*A Knowledge of Part VI. of "The Mining Act, 1891."*

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