

4. How do you ascertain the strength of KCN solutions to satisfactorily treat the particular class of ore you have to deal with ?
5. In making up 30 tons of a sump solution containing 0.01 per cent. of KCN to a 2.5 solution, how many pounds of crude cyanide containing 75 per cent. of KCN would be required ?
6. In using 40 tons of a sump solution containing 0.03 per cent. of KCN to make up 2 per cent. solution, how many tons of 3 per cent. KCN would be required ?
7. How many tons of 1.6 solution would be required to make up 20 tons of a 0.2 solution using 0.02 of a sump solution ?
8. How is KCN solution prepared ? State fully.
9. A vat 30 ft. in diameter contains pulverized ore to a depth of 5 ft. 3 in. : how many tons of ore would it contain, allowing 70 cubic feet to the ton ? Also, what quantity of KCN solution would be required to treat this amount of ore ?
10. Describe the effect ores containing lead, antimony, zinc, and copper have on the treatment of auriferous ores containing these metals, by KCN solutions.
11. If a workman suffered from hydrocyanic poisoning, how would you treat him, and what antidote would you apply ?
12. What effect (if any) has chlorine-gas on the workmen if they inhale it, and what remedy would you apply ?

SUBJECT E.—*The Sampling and Testing of Ores.*

1. A gold-silver ore-sample weighs 5 lb., and is found to contain "metallics," the amount of which in the sample weighs 0.078 grain bullion ; this bullion on parting is found to contain 0.024 grain of gold ; an assay of 1 A.T. of the sample (free from metallics) gives bullion 9.32 milligrams, containing 2.65 milligrams gold : how would you report the results so as to show the amounts and values of gold and silver respectively per ton ? (Gold, 84s. per ounce ; silver, 2s. per ounce).
2. What precautions have to be taken in determining the amount of moisture in a bagged lot of pyrite concentrates, and why ?
3. Describe a method of assaying a gold cyanide solution for gold.
4. A sample of tailings has been tested for cyanide-consumption, and shows an excessive amount : what tests would you make to determine the likely cause or causes of such consumption ?
5. A sample of tailings from a cyanide plant has been assayed for gold, and shows a high assay ; it is assumed that this result is owing to the ore not being crushed fine enough : how would you, as an assayer, proceed to determine whether such is the case or not ?
6. How would you assay a sample of gold-amalgam for gold only ? (Give outline only of process).
7. A bar of bullion weighs 472 oz. 9 dwt., and assays 927. State the following : (a) Fine weight of bar ; (b) "standard" weight of bar ; (c) value of bar.
8. Describe the preparation of pure silver from waste silver-chloride of the assay laboratory.

SUBJECT F.—*A Knowledge of Arithmetic and the Method of keeping Battery Accounts.*

1. The wages in connection with a crushing-battery and cyanide plant amount to £560 a month of 24 days, 40 men being employed at different rates—the A division are paid £14 8s. per man ; B division, 20 men, 90 per cent. per man of the amount paid to each of the men in A division ; the C division, 13 men, 106 per cent. of the amount paid to each man in B division ; and the balance is paid to 3 men in D division : how much does each man receive per day ?
2. A certain piece of work was done by 14 men and 6 youths in 20 hours : how long would it take 4 men, 7 youths, and 4 boys to do the same amount of work, taking 4 youths to be equal to 3 men, and each boy to do three-fourths of the work to be done by each youth ?
3. The value of bullion containing gold, silver, and copper was £6,000 ; 10 per cent. of the bullion was gold, 85 per cent. silver, and the balance copper : taking gold at £4 per ounce, silver at 2s. 2d. per ounce, and copper at £65 per ton of 2,000 lb. troy weight, what would be the weight and value of the gold, silver, and copper in the bullion ?
4. In crushing with a battery of stamps having a drop of 7 in., show by calculation how many drops per minute can be made without the tappets on the stamps' shanks falling on to the cams.
5. Square 0.00312, and extract the cube root arithmetically of the quotient.