5. If a cubic foot of marble weighs 2·716 times as much as a cubic foot of water, find the weight of a block of marble 6 ft. 4 in. long, 1 ft. 6 in. broad, and 1 ft. thick, having given that a cubic foot of water weighs 1,000 oz.

6. Find the sum, difference, product, and two quotients of 10·01 and 0·0091, and the sum of the five results.

7. A merchant fails for £7,852 16s., and pays a first dividend of 11s. 8d. in the pound, and afterwards a second dividend of 8s. 9d. in the pound on what was then due: find what his estate realised, and how much in the pound he paid altogether.

8. What distance will a train travel in 3 hours 39 minutes 22 seconds at a speed of 49 miles 7 furlongs 52 yards an hour?

9. A person bought railway stock at $88\frac{3}{4}$, and, after receiving a half-year's dividend at the rate of $4\frac{1}{2}$ per cent. per annum, sold out at $93\frac{5}{8}$, and made a profit of £142 10s.: how much stock did he buy?

10. A farmer bought 749 sheep, and sold 700 of them for the price he paid for the whole, and afterwards sold the remainder at the same price a head as the others: find the gain per cent.

11. The capacity of a cistern is the sum of two cubes whose edges are 10 in. and 2 in. respectively, and the area of its base is the difference of two squares whose sides are $1\frac{1}{9}$ ft. and $1\frac{2}{9}$ ft. respectively: find its depth.

12. The capital of a company is £64,875, and the profits of the year amount to £5,143 11s.: find to the nearest quarter the highest dividend that can be paid, and how much will be carried forward.

Arithmetic.—For Class E, and for Junior Civil Service. Time allowed: 3 hours.

1. (*a*.) Multiply 54·87797 by 1·52332.
   (*b*.) Divide 4·318234 by 9·019582.
   (*c*.) Find the L.C.M. of $19\frac{1}{8}$, $19\frac{5}{6}$, and $21\frac{1}{4}$.

In (*a*) and (*b*) give the result correct to three places of decimals.

2. There are three railway lines each one mile long: one rises 1 ft. 9 in. for every 100 ft. of line; another rises 1 ft. in every 53 ft. of line; and the third rises 106 ft. in the mile: which line is the steepest, and how much does each line rise in a distance of 76 chains 24 links?

3. A gallon of water weighs 10 lb. avoirdupois, and a cubic foot of water weighs 62·355 lb. Find correctly to two places of decimals the number of cubic inches in a gallon.

4. The sides of a rectangular plot of grass are 125 ft. and 65 ft. 6 in.: find its area in square feet, and find the length of the side of a square of equal area.

5. If £1 = 4·86 dollars, find the price in English money of 78 cwt. 3 qr. 12 lb. at 15 dollars 20 cents a hundredweight.

6. The driving wheel of a locomotive is 44 in. in diameter: how many times will the wheel revolve while the locomotive travels ten miles? [*Note.*—The circumference of a circle may be taken as 3·1416 times the diameter.]

7. A bankrupt's debts amount to £3,549, and he is expected to pay 12s. 6d. in the pound. If it is found that his assets have been overestimated by £133 1s. 9d., how much in the pound can he actually pay?

8. What sum would amount to £1,405 19s. in three years at compound interest if the rate is 3 per cent. per annum for the first year, 4 per cent. per annum for the second year, and 5 per cent. for the third year?

9. The Post Office Savings Bank allows interest at 3 per cent. per annum on money deposited for each complete month the money is in the bank. A depositor opens an account in January, 1898, by paying in £5 on the 31st January, and he pays in £5 on the last day of each month of the year: find the interest due to him on the 1st January, 1899.

10. What sum of money must be invested in the 3-per-cents at 102 to secure an income of £940 clear of income-tax at 5d. in the pound?

11. A manufacturer ships a crate 10 ft. 2 in. long, 7 ft. 9 in. wide, and 5 ft. 5 in. high: give the dimensions in centimetres, and find how many cubic metres the crate contains. [*Note.*—1 inch = 2·54 centimetres.]

12. Gold is sold to the mint at £3 17s. 9d. an ounce, and is mixed with an alloy worth 5s. 2d. an ounce, in the proportion of 11 of gold to 1 of alloy. Sovereigns are coined of the mixture, each weighing 5 dwt. 4 gr.: find to the nearest penny the mint profit on 100 sovereigns.

Arithmetic.—For Senior Civil Service. Time allowed: 3 hours.

1. Find the value of 3 tons 3 cwt. 3 qr. 21 lb. at 16s. 8d. per cwt.

2. Show how the product of 315 and 285 may be obtained without multiplying out.

3. Simplify $\left\{1+\frac{1}{2}\left(\frac{\frac{3}{4}+\frac{5}{6}}{\frac{7}{8}+\frac{5}{12}}\right)\right\} \times \frac{3\frac{5}{7}-2\frac{1}{2} \text{ of } 1\frac{1}{14}}{3\frac{5}{7} \text{ of } 2\frac{1}{2}-1\frac{1}{14}} \div \frac{8\frac{4}{5}}{10\frac{3}{25}}$.

4. Divide 0·0576495 by 384·33; and express $1\cdot\dot{2}$ year $- 1\cdot3\dot{2}\dot{7}$ of 308 days as the decimal of half a year.

5. Show that the difference between the simple interest and the true discount on any sum of money for a given time at a given rate is equal to the interest on the true discount for the same time and rate; and find this difference on £750 16s. due $2\frac{1}{2}$ years hence at $2\frac{2}{5}$ per cent.

6. A has an income which is $0\cdot\dot{6}\dot{9}$ of $\left\{\frac{7\frac{3}{4}-3\frac{1}{2}}{7\frac{3}{4}+3\frac{1}{2}} \div \frac{17}{15}\right\}$ of B's: compare their incomes; and, if B after spending £364 per annum has a surplus of 0·545 of his income, find A's income.