

6. A man sold a piece of land for £2,265 8s., and lost 8 per cent. on his purchase-money: at what price would he have had to sell it to gain 7 per cent.?

7. Find the discount on £2,484 11s. 10 $\frac{1}{2}$ d., due 2 years hence, at 7 $\frac{1}{2}$ per cent. compound interest.

8. A bath which has vertical ends is 6ft. 6in. long, 2ft. deep, and 2 $\frac{1}{2}$ ft. wide at the top and 1 $\frac{1}{2}$ ft. wide at the bottom, and its sides are planes. Find how many gallons of water it will hold, assuming that a gallon of water contains 277 $\frac{1}{4}$ cubic inches.

Also find the cost of completely lining it with lead a square foot of which weighs 6 $\frac{1}{2}$ lb., and which costs 3 $\frac{1}{2}$ d. per pound.

9. A man has a sum of money in the 4-per-cent. stock which gives him an income of £500 a year. When the stock is at 102 $\frac{1}{2}$ he sells out, and invests £5,400 in the 5-per-cents at 108, and the remainder in the 3-per-cent. stock. If his income be £10 a year less than formerly, find the price of the 3-per-cents.

10. If 6 men do 6006 of a piece of work in 1.76 hours, how long will it take 3 boys to finish it, it being known that 3 men and 7 boys have done a similar piece of work in 3 hours?

11. A workman finds that he has to spend 80 per cent. of his earnings on the bare necessities of life. In consequence of an increase in the tariff, his wages rise 20 per cent., and the cost of everything he buys rises 25 per cent.: compare the purchasing powers of the sums of money which he is able under the two systems of taxation to devote to purposes other than buying necessities.

Examine in the same way the case of a richer person who had originally to spend 30 per cent. out of his income on necessities, and whose income is increased 10 per cent. by the new tariff.

12. At an election there were two candidates, A and B. According to the promises of votes, A expected to have a majority of 50; but, A having polled only 80 per cent. of his promises, whilst B polled 87 $\frac{1}{2}$ per cent. of his promises, B was elected by a majority of 50. How many votes did each candidate actually get?

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

1. A person has an income of £200, and pays 4d. in the £1 income-tax: when 2 $\frac{1}{2}$ d. in the 11b. is taken off sugar, what must be his yearly consumption that he may just save his income-tax?

2. Show that in every division the dividend is greater than twice the remainder. Show also that any number having 2, 1, and 6 for the last three figures is divisible by 72, provided that the sum of the remaining digits is divisible by 9.

3. Find the G.C.M. of 47154 and 172347, and the L.C.M. of 28, 136, 357, 595, 4760.

4. Find the value of $\frac{5}{3\frac{1}{2}}$ of 5 $\frac{1}{2}$ of £273 2s. 6d.;

and reduce $\frac{3\frac{1}{2}}{1\frac{1}{3}} \left\{ \frac{19}{120} \text{ of } £1 - \frac{7}{48} \text{ of } 1\text{s.} \right\}$ to the fraction of 29s.

5. What is the least factor which will make the product of the first 10 natural numbers a perfect square?

6. Find the value of $.1 \times .1 \times .1 \times .1 \times .1 \div .00125$; and of 2.86805 of 3s. + 8.3 of 4s. — 1.8 of 5s.

7. What will it cost to paint the outside of a cubical box, whose edge is 4.5ft., at 1.16s. per square yard?

8. A man buys a lot of apples, half at four a penny and half at two a penny, and retails the lot at three a penny: what is his gain or loss per cent.?

9. A cubic foot of water weighs 1,000oz., and the weight of a given volume of air equals the weight of the same volume of water $\times .00125$. Find the weight of air in a room 34ft. long, 16ft. wide, and 7.5ft. high.

10. The gross receipts of a railway company in a certain year are apportioned as follows: 43 per cent. to pay working-expenses, 52 per cent. to pay a dividend of 3 $\frac{1}{4}$ per cent., and the remainder, £25,000, is reserved. Find the paid-up capital of the company.

11. A train starts from B at 15 miles an hour; two hours later another train follows at the rate of 25 miles an hour: at what distance from B will it overtake the first? and what interval of time will elapse between the passing of the two trains through a station 30 miles from B?

12. How much stock at 92 $\frac{3}{4}$ must be sold to pay a bill of £715 17s., due 9 months hence, at 4 per cent.?

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

1. Multiply £4,279 13s. 8 $\frac{1}{2}$ d. by 14; also multiply the same sum of money by 9, and by 5, respectively, and add the last two results.

2. What is meant by the symbol $\frac{3}{4}$? Show that the quantities represented by $\frac{3}{4}$, and by $\frac{2}{1\frac{1}{2}}$, are equal.

3. Simplify—

$$(a.) \left(8\frac{5}{18} + 9\frac{19}{27} + 17\frac{11}{36} \right) - \left(\frac{13}{40} + 2\frac{11}{20} \right);$$

$$(b.) \left(3\frac{1}{4} \text{ of } 1\frac{1}{3} \right) + \left(2\frac{1}{2} - \frac{1}{3} \right) \text{ of } \left(3\frac{1}{2} - \frac{1}{4} \right).$$

4. Divide 10.836 by 51.6. Also divide 1083.6 by 5.16, and also by .00516. Prove each result by vulgar fractions.

5. Divide £2,025 among five persons—A, B, C, D, E—so that A's share is half of B's, B's share is to C's as 4 to 5, C's share is to D's as 5 to 6, and D's share is to E's as 3 to 4.

6. What is meant by rate per cent.? Find the compound interest on £64,000 for 3 years at 5 per cent. per annum.

7. A can do a piece of work in 27 days, and B in 15 days. A works at it for 12 days alone, B then works at it for 5 days alone, and C takes 4 days to finish it. In how many days could C do the whole work alone?