

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

NOTE.—The full working of the questions, and not merely the results, must in all cases be given.

1. Divide 289145 by 252 by factors; and explain the method by which you obtain the remainder.

2. Simplify (a.) $\frac{3\frac{5}{7} \div 2\frac{4}{11}}{\frac{7}{8} \text{ of } (11\frac{3}{4} - 2\frac{1}{8})} \div \frac{3\frac{2}{3} \text{ of } 5\frac{2}{3}}{5\frac{1}{16} + \frac{1}{2} \text{ of } 4\frac{3}{8}}$

(b.) $\frac{1}{2} \text{ of } \frac{3}{4} \text{ of } \frac{2}{3} + \frac{3}{4} + \frac{2}{15} - \frac{5}{12} + \frac{1}{3} - \frac{23}{30} + \frac{1}{2 + \frac{1}{3\frac{1}{2}}}$

3. Show that 0.318 differs less from 0.317875 than 0.317 does; and find the least actual error that need be made, if we retain only three places of decimals, in finding the value of 0.317875 of £100.

4. Find the value of 3.345 of £4 11s. 8d. + 2.0136 of £2 1s. 3d. + 0.714285 of 10s. 6d.

5. How many revolutions will be made by a wheel turning at the rate of 360 revolutions in 7 minutes, while another turning at the rate of 470 in 8 minutes makes 658 revolutions?

6. Explain the difference between banker's discount and true discount; and find it on a bill for £1,550 due 8 months hence at 5 per cent.

7. A and B between them contract to perform a certain amount of work for £1,245. A employs on it 180 children for 3 months, 80 women for 2 months, and 40 men for 1 month; B employs 120 children for 2 months, 60 women for $1\frac{1}{2}$ months, and 80 men for $2\frac{1}{2}$ months: how much should each of the two (A and B) receive? (A woman does twice as much work as a child, and a man does three times as much as a child.)

8. A man has stock in the 3-per-cents which produces him an income of £300 a year. He sells out half of it at 92, and invests the proceeds in railway stock of which a fifty pound share is worth £23: what dividend per cent. per annum ought the railway stock to pay so that his total income may be increased by £50?

9. A sells goods to B at a loss of 4 per cent., B sells them to C at a loss of $6\frac{1}{4}$ per cent., C sells them to D for £24 8s. 3d., gaining thereby $8\frac{1}{2}$ per cent.: what was the original cost?

10. When hay was fetching £5 a ton, a farmer hid himself in a load, and his weight was added to that of the hay. Before the hay was shipped the error was detected, and, after another weighing, 7s. 6d. was deducted from the price: find the weight of the farmer.

11. Explain the meaning of the term "par of exchange." If an American dollar at par be worth 4s. 6d., what is the value of 642 dollars when the exchange is 7 per cent. in favour of England?

12. A can do $2\frac{1}{2}$ and B $1\frac{1}{2}$ times as much work in a day as C. A and C are employed together for 10 days on a piece of work which they would finish in another 12 days; but, after the tenth day, A is taken off, and B put on: when will the work be finished?

Geography.—For Class D. Time allowed: 3 hours.

1. What is the cause of the phenomenon of the "midnight sun" in the polar regions? Why are the summer days longer at Invercargill than at Auckland?

2. Name the principal types of man, and give the most important races belonging to each type.

3. Explain very briefly the following terms: tropic, monsoon, geyser, atoll, metamorphic rock, tundra, hoar-frost, waterspout, tidal wave, Gulf Stream.

4. Mention the principal mountain ranges of Europe, omitting those which have no historical importance. What countries or districts do the following passes connect: Mont Cenis, St. Gothard, the Iron Gate, Killiecrankie, the Brenner.

5. Draw a sketch-map of South America, showing the course of the Orinoco, the Amazon, and the La Plata. Mark the position of Peru, Chili, Venezuela, British Guiana.

6. Write a brief note on each of the following places: Madras, Rangoon, Allahabad, Peshawur, Cabul, Tientsin, Oporto, Shanghai, Liverpool, Minneapolis.

7. Where are the principal coal measures of the world? Which of them are being extensively worked, and what towns have risen to importance through their proximity to coalfields? Name also the principal deposits of mineral oil.

8. What is the cause of the north-west winds of Canterbury? Compare them with hot winds that prevail in Europe.

9. From what countries are the following articles chiefly derived: tobacco, opium, rice, tapioca, tea, jute, quicksilver, copper, shoe leather, cocoa.

10. The exports of New Zealand amount this year to about £13,000,000 in value. What items contribute principally to this total? Give roughly their respective values.

11. Name all the towns of the world which possess a million or more inhabitants.

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

1. Explain the terms atoll, doldrums, ecliptic, fiord, ice-floe, pampas, roadstead, selvas, simoom, typhoon.

2. What are the causes of ocean currents? Enumerate and describe the chief ocean currents, and discuss their effect upon the climate of the countries whose shores they wash.

3. Give as full an account as you can of the causes and phenomena of the tides.