15. Name sovereigns of France and Spain who were contemporary with Elizabeth, Charles II., and George III., and give a brief account of the foreign policy of Charles II.

DOMESTIC ECONOMY.

Three hours allowed for this paper.

Candidates are not permitted to answer more than *one* Question in each Section.

SECTION I. (*Needlework.*)—1. Describe fully the following stitches, and say in what garments and materials they are commonly used, and how you would teach them to children.—*hemming, felling, back-stitching, feather-stitching* (*i.e.*, coral stitching.)

2. Describe the process of cutting out and making a pinafore for a girl six years old, with exact measurements, and an account of the materials required.

SECTION II. (*Savings and Investments.*)—1. State the annual income on which, in your opinion, a retired Schoolmistress could live in comfort in her old age; and the methods of saving and investment in her days of full work and salary, by which she could provide that income on retirement.

On what weekly wages can an artisan maintain in comfort himself, his wife, and four children between the ages of four and ten:—and in what proportion should he distribute those wages in rent, food, clothing, education of his children, recreation, and savings?

SECTION III. (*Food—its ingredients.*)—1. What effect is produced on the human body by food containing in large quantities the following substances respectively: (*a*) sugar, (*b*) lime, (*c*) salt, (*d*) animal oils?

2. State fully what are the objections to a diet either exclusively vegetable or exclusively animal.

SECTION IV. (*Food—its preparation.*)—1. Describe the efficient modes of cooking potatoes; give your own opinion as to the merits of each, and say for what dish of meat each mode of cooking them is most suitable.

2. Give an account of the materials, preparation, and cooking of an economical and wholesome dinner for a Schoolmistress living alone.

SECTION V. (*Rules for Health.*)—1. Mention any respects in which the modern fashion of female dress is injurious to health, and show in what way each foolish practice in dressing produces its bad effects.

2. Give plain rules for the preservation of health for a Pupil Teacher (*a*) who lives in the country a mile from her school, and (*b*) for a Pupil Teacher in London living a few doors from her school.

3. What would you do before the doctor came, if a child in your school (*a*) was badly scalded, (*b*) had fainted, (*c*) had cut his arm above the elbow?

SECTION VI. (*Clothing and Washing.*)—1. Describe the modes of washing, drying, and getting up the different articles which would go into the tub on washing-day in a labourer's cottage.

2. Give an account of the price, material, colour, and making up of a neat dress for your own summer wear in school, and say how it should be washed and worn so as to last as long as possible.

MALE CANDIDATES.

ARITHMETIC.

Three hours allowed for this paper.

Candidates may answer all the questions.

The *solution* must be given at such length as to be intelligible to the examiner, otherwise the answer will be considered of no value.

1. Add together the products of each pair of the numbers 150, 225, 375, and find the difference between this sum and the product of all three numbers.

2. Divide 16 acres 3 roods 2 poles among four brothers, giving the eldest brother half as much again as each of the others, and find the value of the eldest brother's share at a guinea for each pole.

3. Find, by practice, the value of 17 lbs. 11 ozs. 16 dwts. 9 grs. of gold at £3 12s. 8*d.* per oz.

4. Find the difference between $\frac{\frac{1}{2}-\frac{1}{3}}{\frac{1}{2}+\frac{1}{3}}$ of 19s. 10*d.*, and $\frac{3\frac{1}{3}+2\frac{1}{2}}{3\frac{1}{3}-2\frac{1}{2}}$ of $1\frac{3}{4}$*d.*, and reduce the difference to the fraction of 4s. $5\frac{1}{2}$*d.*

5. Express as decimal of a pound $\frac{3}{8}$ of $5\frac{1}{4}$ of 3s. 9*d.*, and find the value of that decimal of a yard.

6. Write out clearly and concisely the rules for—
   (*a*) finding the G. C. M. of two numbers;
   (*b*) finding mentally the product of 1616 by 625;
   (*c*) substraction of vulgar fractions.

7. If the larger wheel of a bicycle whose circumference is 8 yards, 0 feet, $5\frac{1}{2}$ inches, make 200 more revolutions than that of another bicycle in travelling 5 miles, find the circumference of the latter wheel.

8. 320 men begin a piece of work; it is completed in 6 days of 10 hours each, but on each day only half of those employed on the previous day are at work; in what time would 105 men working 6 hours a day have completed it?

9. Find the present value of £1363 due five years hence at $3\frac{1}{2}$ per cent. per annum simple interest.

10. A sum of £8505 invested in the Three per Cents. produces an income of £252; what is the price of the stock?

11. Extract the square root of ·892143 of $12\frac{1}{4}$ square feet.

12. 800 yards of cloth are bought at 10s. 6*d.* per yard: half is sold at 10s. per yard, a fifth for 11s.; at what price must the remainder be sold to obtain a gain of $5\frac{1}{2}$ per cent. on the whole?

EUCLID ALGEBRA, AND MENSURATION.

Three hours allowed for this paper.

Candidates who attempt either of the questions in Mensuration must omit questions 11 and 12. (Marks are given for portions of questions.)

EUCLID.

In the Euclid questions all generally understood abbreviations for *words* may be used, but no symbols of *operations* (such as —, +, ×,) are admissible. N.B.—Capital letters, not numbers, must be used in the diagrams.

1. If two triangles have two sides of the one equal to two sides of the other, each to each, and have likewise their bases equal; the angle which is contained by the two sides of the one shall be equal to the angle contained by the two sides, equal to them, of the other.

On the base of an isosceles triangle an equilateral triangle is described: show that the line joining the vertices of the two triangles bisects their common base at right angles.

What is the axiom on which Euclid bases his reasonings on parallel lines? Is Proposition 17 of the First Book the converse of that axiom? If so, is there any objection to the axiom?

If a straight line falls on two parallel straight lines, it makes the alternate angles equal to one another, and the exterior angle equal to the interior and opposite angle on the same side; and also the two interior angles on the same side together equal to two right angles.

3. In any right-angled triangle, the square which is described on the side subtending the right angle is equal to the squares described on the sides which contain the right angle.

From the middle point of a side of a right-angled triangle a perpendicular is drawn to the hypotenuse; show that the difference of the squares on the segments into which it is divided is equal to the square on the other side.

4. By what proposition of the First Book is it proved that the area of a triangle whose altitude is a units long, and whose base is b units long, is $\frac{1}{2}ab$?

If a straight line be divided into two equal parts, and also into two unequal parts, the rectangle contained by the unequal parts, together with the square on the line between the points of section, is equal to the square on half the line.

5 Why cannot we satisfactorily demonstrate propositions of the Second Book by algebraical processes?

In every triangle, the square on the side subtending an acute angle is less than the squares on the sides containing that angle by twice the rectangle contained by either of these sides, and the straight line intercepted between the perpendicular let fall on it from the opposite angle and the acute angle.

IGEBRA.

6. Express algebraically:—the fourth power of the sum of two numbers (a and b), together with twice the product of their squares is equal to the sum of their fourth powers together with four times the product of their product and the square of their sum. Also verify it when $a=2$, $b=3$.

7. Subtract:—
$(x+y)(3a-2b)$ from $(x+y)(3a+2b)$; and divide $x^2+y^2+1-2y+2x-2xy$ by $x+y+1$.

8. Prove the rule for dividing one algebraical fraction by another, the letters denoting any numbers.