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LEAVING CERTIFICATE EXAMINATION, 1936.

PASS:

MATHEMATICS
(ALGEBRA)

MONDAY, 22nd JUNE.—AFTERNOON, 3.30 TO 6 P.M.

Seven questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Find the values of x , y , z , which satisfy the equations :

$$\left. \begin{aligned} 3x+2y-4z &= 2 \\ 3x+5y-3z &= -6 \\ x-6y-7z &= 15 \end{aligned} \right\}$$

[25 marks.]

2. Factorise

(i) $a^2-b^2+a+11b-30$.

(ii) $(a+b)^3+(b+c)^3+(c+a)^3+a^3+b^3+c^3$.

[25 marks.]

3. Solve the equations

(i) $4\sqrt{2x-1} - \frac{15}{\sqrt{2x-1}} = 7$

(ii) $\left. \begin{aligned} x^2+3xy+y^2 &= -5 \\ x^2-5xy+y^2 &= 43 \end{aligned} \right\}$

[25 marks.]

4. The 30th term of an Arithmetical Progression is 206 and the 62nd term is 430. Find

(i) how many terms of the series are less than 1000,

(ii) the sum of all the terms which are less than 1000.

[25 marks.]

5. Express in its simplest surd form

$$\frac{(\sqrt{3}-\sqrt{2})(2+\sqrt{3})}{\sqrt{7+4\sqrt{3}}} + \frac{\sqrt{5-2\sqrt{6}}}{(\sqrt{3}+1)(\sqrt{3}-\sqrt{2})}$$

and find its value correct to *three* places of decimals

[25 marks.]

6. p, q, r , are any numbers: find a number x such that $p-x, q-x, r-x$ shall be in Geometrical Progression.

If $(35-x), (23-x), (17-x)$ are successive terms of a Geometrical Progression, find (i) the value of x , (ii) the sum of 20 terms of the series.

[30 marks.]

7. The length of a rectangular picture exceeds its breadth by 4 ins. Outside the picture is a border c ins. wide and outside the border is a frame c ins. wide. The areas of the border and the frame are 160 sq. ins. and 192 sq. ins. respectively. Find (i) the value of c , (ii) the dimensions of the picture.

[30 marks.]

8. Express in the simplest form without using Tables:

$$\log \frac{3675}{256} + \log \frac{1024}{441} - \log \frac{280}{42}$$

Using the Tables find what value of x will satisfy the equation $4.93^x = 26.82^3$.

[30 marks.]

9. Using the same axes and the same scales draw accurately the graphs of

$$y = \frac{x-1}{x+1} \text{ and } 4x+5y = 20.$$

Write down (i) the equation in x whose roots are determined by the points of intersection of the graphs, (ii) the approximate values of the roots of that equation.

[30 marks.]

10. Find the minimum value of $3x^2+7x-12$ and the maximum value of $2(31-2x)(x-5)$.

[30 marks.]