**P425/1**

**PURE MATHEMATICS**

**Paper 1**

**TUESDAY, 6th August 2019 (Morning)**

**3 hours**

ACHOLI SECONDARY SCHOOLS EXAMINATIONS COMMITTEE

*Uganda Advanced Certificate of Education*

Joint Mock Examinations, 2019

PURE MATHEMATICS

Paper 1

3 hours

INSTRUCTIONS TO CANDIDATES:

* *Attempt ALL the questions in section A and any FIVE in section B.*
* *Begin every question on a fresh page.*
* *Show all the necessary working.*
* *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A** (40 marks)

*Answer ALL the questions from this section.*

**1.** Solve for x if log2x + logx16 = 4 (05 marks)

**2.** Find the Cartesian equation of the locus Z of |Z – 2 + *i| =* 1, given that Z is a complex

number. (05 marks)

**3.** Find the Cartesian equation of a line through points (2, 0, 1) and (–1, 4, 1). (05 marks)

**4.** Solve the equation 2 cos α + 3 sin α = 5 for –π ≤ α ≤ π. (05 marks)

**5.** Evaluate . (05 marks)

**6.** Find the equation of the tangent to the curve 2xy = 3 at the point when x = 3. (05 marks)

**7.** Find the acute angle between the lines 3y – x – 6 = 0 and y – 2x + 4 = 0. (05 marks)

**8.** Find the Cartesian equation of a curve whose polar equation is r = 4 sin θ. (05 marks)

**SECTION B** (60 marks)

*Answer only FIVE questions from this section.*

**9:** (a) Find the distance of the point (2, 1, 2) from the line x – 1 = y – 2 = z – 3. (07 marks)

 (b) Find the position vector of the point of intersection of the planes x – 2y – 2z = 0;

 2x + 3y + z = 1 and 3x – y – 3z = 3. (05 marks)

**10:** (a) The first three terms of a geometric progression (GP) are x – 1, x + 2 and 3x. Find

 the value of x, given that x is positive and hence, find the sum of the first six terms

 of the GP. (06 marks)

 (b) The fifth term of an AP is 25 and the fifteenth term is 75. Find the 10th term. (06 marks)

**11:** Express  into partial fractions. Hence, compute 

 (12 marks)

**12:** (a) Solve for θ if sin2 = 2 + cos θ for 180° ≤ θ ≤ 360°. (05 marks)

 (b) Solve triangle ABC where c = 5.2cm, a = 7.4cm and angle B = 41°. (07 marks)

**13:** (a) Find the equation of the circle which passes through the points (1, 2), (2, 5) and (–3, 4).

 (05 marks)

 (b) A and B are points (3, 0) and (–1, –3) respectively. P is a variable point such that angle

 APB is right angled. Find and sketch the locus of P. (07 marks)

**14:** Differentiate (i) cot–1 (*ln* x) (ii) (sin x)x (12 marks)

**15:** Solve (a) x <  (05 marks)

 (b)  (07 marks)

**16:** (a) Find the general solution of  (xx marks)

(b) The rate at which a radioactive material decays is proportional to the amount of such material present. Half of the original mass M of the radioactive material undergoes disintegration in a period of 1500 years.

1. What percentage of the original mass will remain after 3000 years? (xx marks)
2. In how many years will one tenth of the original mass remain? (xx marks)

\*THE END\*

*The End*.