P425/1

PURE MATHEMATICS

AUGUST - 2019

3 HOURS



JINJA JOINT EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

MOCK EXAMINATIONS – AUGUST, 2019

PURE MATHEMATICS

Paper 1

3 HOURS

INSTRUCTIONS TO CANDIDATES

*Answer* ***all the eight*** *questions in section* ***A*** *and any* ***five*** *from section* ***B****.*

*Any additional question(s) will* ***not*** *be marked.*

*All working* ***must*** *be shown clearly.*

*Begin each question on a fresh sheet of paper.*

*Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A (40 MARKS)**

*Answer* ***all*** *questions in this section*

1. Solve the equation for

(05 marks)

1. Solve the inequality (05 marks)
2. Evaluate  (05 marks)
3. A circle C, has the equation;

.

Find the;

1. Coordinates of its centre (02 marks)
2. Shortest distance of the point A(5, 4) from the circle. (03 marks)
3. A committee of six members is to be chosen from among five men and three women such that atleast two members of each group serve on the committee. Find the number of possible committees that can be formed. (05 marks)
4. Solve the differential equation

given that (05 marks)

1. Find the perpendicular distance of the point P (0, 6, 0) from the line with Cartesian equation, . (05 marks)
2. Given that: show that  (05 marks)

**SECTION B (60 MARKS)**

*Answer any* ***five*** *question from this section. All questions carry equal marks*

1. (a)Solve the simultaneous equations

(05 marks)

(b) When a polynomial is divided by the remainder is

Find the remainder when is divided by

(i)

(ii) (07 marks)

1. (a) Express in the form; where R is a constant and

is an acute angle. Hence solve the equation

for (07marks)

(b) In any triangle ABC, show that (05 marks)

1. The normal to the parabola y2 = 4 at the point P( meets the axis

of the parabola at G. If GP is produced beyond P to Q such that GP = PQ,

show that the equation of the locus of Q is (12 marks)

1. (a) Given the complex numbers and
2. Express Z1 and Z2 in polar form
3. Find the value of (06 marks)

(b) If is one root of the equation

Determine the other roots of the equation. (06 marks)

1. Express into partial fractions. Hence show

that (12 marks)

1. (a) The line L1 passes through the points A and B whose position vectors are

and respectively. Find in vector form, the equation of the line L1. (04 marks)

(b) The line L2 has the equation where

is a scalar parameter.

(i) show that the lines L1 and L2 intersect.

(ii) Determine the position vector of the point of intersection (08 marks)

1. Given the curve;
2. Find the:

(i) equations of the three asymptotes of the curve. (03 marks)

(ii) stationary point of the curve and determine its nature. (04 marks)

1. Sketch the curve. (05 marks)
2. (a) Given the curve, show from the first principles that (06 marks)

(b) If show that (06 marks)