**MOCK SET I EXAMINATIONS 2019**

**Uganda Advanced Certificate of Education**

**PURE MATHEMATICS**

**P425/1**

2 Hours 30 Minutes

**Instructions to Candidate:**

* *Attempt all the eight questions in section A and any five questions in section B.*
* *All working must be shown clearly*
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* *Begin each answer on a fresh sheet of paper.*
* *Silent non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A**

1. If Prove that;

2. Given that, show that

.

3. Prove that the

4. The distance of the centre of the circle of radius from the line units. Find the equation of the tangent to the circle which is parallel to the line

5. Show that the line is parallel to the plane 4x – y – 3z = 4, and find the perpendicular distance of the line from the plane.

6. Find x if .

7. The expression has a remainder when it is divided by x2-x-2, find values of a and b.

8. If , show that

**SECTION B**

**Attempt any 5 questions ONLY**

9. a) Solve the inequality;

b) Given that f(x) = , show that . Hence find the first two non-vanishing terms of the maclaurin’s expansion.

10. a) Find , give your answer to 2 decimal places.

11. (i) Show that In2r for r = 1,2,3,………. is an arithmetic progression.

(ii) Find the sum of the first 10 terms of the progression.

(iii) Determine the least value of m for which the first 2m terms exceeds 883.7.

12. a) A tangent from the point T(t2,2t) touches the curve y2 = 4x. Find

i) The equation of the tangent

ii) The equation of the L parallel to the Normal at (t2, 2t) and passing through (1,0).

iii) The point of intersection of the line L and the tangent.

b) A point P() is equidistant from x and T. show that the locus of -3t – 2() = 0

13. a) Without using tables, evaluate,

b)

14. a) Find the Cartesian equation of the plane containing the points A(2,-1,1) B(1,-2,0) and C(-3,6,1). Find the angle between this plane and the line;

b) The position vector of points **A** and **B** are 3– **j** + and 4 – 2 respectively. Find the position vector of the foot of the perpendicular from the origin 0 to the line **AB**.

15. a) If (1 +3i)**Z**1 = 5(1+i). Show that the locus of |**z** – **z**1| is a circle. Find the coordinates of the centre and radius of the circle.

b) Given that x and y are real, find the values of x and y which satisfy the equation.

16. a) Solve the differential equation

b) An electric Kettle Switches itself off when the temperature of water in it reaches 100oC at 11:00am when Mr. Nsamba came back and found the temperature of water to be 45oC. 20 minutes later he measured it again and found it to be 65oC. According to the law of heating, the rate of heating of a body in air is proportional to the excess temperature over the surrounding at any time t. if the surrounding temperature was 25oC, Mr Nsamba wants to know the time when the kettle switched off itself.

**END**