P425/1

PURE

MATHEMATICS

Paper 1

August, 2019

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**Community**

UNNASE MOCK EXAMINATIONS

3hrs

Uganda Advanced Certificate of Education

PURE MATHEMATICS

Paper 1

3 hours

INSTRUCTIONS TO CANDIDATES:

* *Attempt* ***all*** *the* ***eight*** *questions in* ***Section A*** *and* ***Not*** *more than* ***five*** *from*
* ***Section B.***
* *Any additional question(s) will not be marked.*
* *All working must be shown clearly.*
* *Silent non-programmabe calculators and mathematical tables with a list of formulae may be used.*
* *Graph papers are provided.*

**SECTION A: (40MARKS)**

*Answer* ***all*** *the questions in this Section.*

1. Find the sum of the numbers between 5 and 250 which are exactly divisible by 4. *(5marks)*

2. Given that the line; meets the plane at . Find the coordinates of M. *(5marks)*

3. Use the substitution to find the integral; . *(5marks)*

4. Express in terms of . Hence prove that; .

*(5marks)*

5. Given and , find the equation of the locus of points which divide in the ratio . *(5marks)*

6. A women football team manager intends to take 18 players for a tournament. The manager has 2 goal keepers, 8 defenders, 4 mid fielders and 8 strikers. In how many ways can the team be chosen if it must contain both goal keepers, atleast 3 midfielders and 7 strikers. *(5marks)*

7. Solve the differential equation; . *(5marks)*

8. Solve for x in the equation; *(5marks)*

**SECTION B (60MARKS)**

*Attempt any* ***five*** *questions from this Section*.

9. Given that , express in partial fraction. Hence evaluate; . *(12marks)*

10. and are two variable points on the parabola If subtends a right angle at the origin, prove that

1. Prove that passes through a fixed point on the axis of the parabola.

b) The tangents at and meet at , find the equation of the locus

of . *(6marks)*

11. a) Differentiate . *(6marks)*

b) Evaluate the integral; . *(6marks)*

12. a) P is the foot of the perpendicular from the point to the line

. Determine the perpendicular distance of A from the line to . *(5marks)*

b) Given the points and . If the point lies on the plane . Find the value of a and the angle between and . *(7marks)*

13. a) Solve the equation for . *(5marks)*

1. Prove that . Hence show that . (7marks)

14. a) Prove that . hence solve the equation . *(5marks)*

b) A polynomial is given by . The ratio of the remainder when is divided by to the remainder when divided by is . find the value of A. *(7marks)*

15. a) If , express Z in modulus argument form. *(5marks)*

b) Use demoiver’s theorem to prove that then

. Hence solve the equation

. *(7marks)*

16. a) Determine the nature of the turning points of the curve .

*(5marks)*

1. The acceleration of a particle is proportional to 2t-3. If the velocity increases from 4ms-1 to 8ms-1 in the first 2 seconds of motion, find;
2. its initial acceleration *(5marks)*
3. the velocity after 5 seconds. *(2marks)*

***\*\*\*\* END \*\*\*\****