Ecolebooks.com

P425/1 PURE MATHEMATICS PAPER 1 June 2017 3 Hours

Uganda Advanced Certificate of Education MOCK EXAMINATIONS 2017 PURE MATHEMATICS Paper 1 3 hours

INSTRUCTIONS TO CANDIDATES:

- Attempt **ALL** the **EIGHT** questions in section **A** and any **FIVE** from section **B**.
- All working must be clearly shown.
- Begin each question on a fresh sheet of paper.
- Mathematical tables with list of formulae and squared paper are provided.
- Silent, non-programmable calculators should be used.

<u>Section A (40 Marks)</u>

(Answer **all** questions in this section)

Qn 1: Simplify: _____ ! + ! . [5]

!!!!

DOWNLOAD MORE RESOURCES LIKE THIS ON **ECOLEBOOKS.COM**

Ecoletooks

Qn 2: Solve the inequality: >	[5]
Qn 3: Prove that $\tan + \tan = \tan $	[5]
Qn 4: The area enclosed by = sin and the =axis for $0 \le \le$ is r about the -axis. Show that the volume generated is	otated [5]
Qn 5: A curve is defined by parametric equations $= 3-2$ and $=$. Find	!
	[5]
Qn 6: Solve the equation: $3\sin 2\# + 8\cos \# = 9$ for $0^{\circ} \le \# \le 360^{\circ}$.	[5]
Qn 7: Find the point of intersection of the line $=$ $= \pm$ with the point of intersection of the line $=$	plane
3+4+225=0.	[5]
Qn 8: Find the equation of the circle which passes through the point – the points of intersection of $+$ – –5=0 and $+$ + 2+5 –1= 0.	3,1 and [5]

Section B (60 Marks)

(Answer only **five** questions from this section)

Question 9:

The line through the points 0,-7,-5 and 6,5,10 intersects the line through 2,11,5 parallel to 33 - 5 + 56.

(i). Find the equations of the lines.

(ii). Determine the coordinates of the points of intersection.

(iii). Calculate the angle between the lines. [12]

Question 10:

DOWNLOAD MORE RESOURCES LIKE THIS ON ECOLEBOOKS.COM

Ecolebooks.com

(a). If A, B and a triangle, $\frac{\sin 2A + \sin 2B + \sin 2C}{\sin A + \sin B + \sin C} = 8 \sin \frac{A}{2} \sin \frac{B}{2} \sin \frac{C}{2}$ C are angles of prove that $\begin{pmatrix} \\ \\ \\ \end{pmatrix} = 2 \sin x + 6 \cos^2 \left(\frac{x}{2}\right)$

(b). Show that : can be written in the form where $0^{\circ} \le \le 360^{\circ}$ and . State the $a + r \cos(x - \beta)$ values of ;, < and . r > 0 What is the maximum β value of : . [12]

Question 11:

(a). If the roots of ;
$$+>+?=0$$
 are in the ratio @:B, prove that
;? $@+B = > @B$
(b). If C and = are the roots of ; $+>+?=0$, form the equation whose
roots are D and E . [12]
 $_{D}$ $_{E}$

Question 12: Given that is a real number, prove that the function : = does

between 2 and 6.

- (i). Find the turning points and distinguish between them.
- (ii). State the equations of the assymptotes.
- (iii). Sketch the graph of =:.

Question 13:



Question 14:

F not lie

[12]

ficeletooks

[12]

During a chemical reaction, two substances 7 and 8 decompose. The number of grams, , of substance 7 present at time, , is given by $= !^{L}M$. There are grams of 8 present at time, , and " is directly proportional to the

product of and . Given that = 20 and " $-\frac{1}{"!"}$ = -40 when = 0, show that $-\frac{1}{"!"}$ = -^M. Hence determine as a function of . Determine the amount of

substance 8remaining when the reaction is essentially complete. [12] **Question 15**:

Two perpendicular corridors in a building are of width ; and >. Prove that the length of the longest ladder which can be taken in a horizontal position from $_{FO}$

one corridor to the other is N; $^{O}F + > ^{O}FP$.

Question 16:

- (i). Show that the equation of the normal to the parabola =4; at the point Q ; ,2; is + = 2; +; ^F.
- (ii). If this normal meets the -axis at R, show that the midpoint, S, of QR has coordinates ;+; ,; .
- (iii). If P is a variable point on the parabola in (i) above, find the Cartesian equation of the locus of M. [12]

END