

UGANDA MARTYRS UNIVERSITY
FACULTY OF BUSINESS ADMINISTRATION AND MANAGEMENT
BAM I (MAIN CAMPUS/ RUBAGA DAY) END OF SEMESTER ONE EXAMINATION
FUNDAMENTALS OF MATHEMATICS (A)
December 20th 2013

Time: 3 hours

Instructions:

- Do not write anything on the question paper
- This paper two sections, A and B.
- Attempt **all** questions in section A and **only four** questions in section B.
- Clearly show all the workings on the answer sheets.
- Begin each question on a new page.

Section A – Compulsory (40marks)

- (i) Simplify the following and give the solution in index form: $18a^7 \div 6a^5$
- (ii) Solve for x: $\log(2x+4) = \frac{1}{2} \log 2$
- (iii) A car was bought for sh. 6,000,000. Every year, it reduces by 5%. Find how long it will take its value to reduce to sh. 3,000,000?
- (iv) Simplify: $\sqrt{18} \times \sqrt{32}$
- (v) Given that $f(x) = 2x - 5$, find $f(-1)$
- (vi) Find the equation of the line passing through $(-1, 4)$ and has a gradient of 3.
- (vii) The price of a hand bag is 8000 more than that of a pair of shoes. Both items are sold for 40,000/=. How much money should Mary carry if intends to buy 15 similar hand bags and 20 similar pairs of shoes?
- (viii) Factorise: $d^2 + 5d - 36$
- (ix) Make the letter in the brackets the subject of the formula: $x(1 + y/b)^n = m$ (y)
- (x) Given the sequence: 1, 4, 16, 64,..., find the seventh term
- (xi) Given that $2y < 4x - 2$, graph the inequality and show the region that satisfies it.
- (xii) Besigye is three times as old as his daughter. Five years ago, the product of their ages was 400. Find their present ages.
- (xiii) Simplify: $2 - 5(2+1)$
- (xiv) At a fundraising ceremony, chicken and goats were slaughtered. Heads and legs of the slaughtered animals were collected in one place for accountability purpose. It was later found out that there were 30 heads and 70 legs altogether. How many chicken and goats were slaughtered altogether?

- (xv) Find the determinant of the matrix below

$$\begin{pmatrix} -1 & 2 & 3 \\ -4 & -5 & 6 \\ 7 & -8 & -9 \end{pmatrix}$$

SECTION B. Attempt *four* questions in section B

1. Use BODMAS to work out the following. (Show all the workings) **15 marks**

- (a) $8 - 3 \times 2$
- (b) $2 \times 6 + 3 - 4 \div 2 - 5 + 20 \div 5 \times 3^2 + 50$
- (c) $(3 + 3 - 5) \times (15 - 5) \times 10 - 99$
- (d) $(6 \times 5 + 30) \div (10^2 + 50) - 100 \div 2$
- (e) $10 + 6 \div 3 + 2 \times 8$

2. Make the letter in the brackets the subject of the formula. **15 marks**

- i. $V = U + at$ (a) ii. $A = \frac{1}{2}bh$ (h) iii. $I = \frac{PRT}{100}$ (P)
- iv. $ax = bx + c$ (x) v. $A = p(1 + r/100)^n$ (n)

3. (a) Find the gradient of the line segment passing through points (4, 3) and (-2, -3)
(b) Find the equation of the line passing through (-1, 4) and has a gradient of 3.
(c) Sketch the line with the following equation: $y = 2x + 3$
(d) Write down the gradient and the coordinate of y-intercept of the following line: $3y + 2x - 5 = 0$
(e) Line L_1 with the equation $2x + 3y = 4$ is perpendicular to line L_2 , passing through (0, 3). Find the equation of line L_2 . **15 marks**

4. (a) Expand and simplify where possible:

(i) $(x + \frac{1}{2})(y + 4)$ (ii) $(4 - 2y)(1 - 3y)$

(b) Factorise: (i) $d^2 + 5d - 36$ (ii) $4c^2 - 25^2$

- (c) The area of a rectangular flower garden is 40 square feet. The length is 4ft more than the width. Find the amount of money needed to buy a barbed wire to fence it with one strand if each foot of wire costs 2,400/= **15 marks**

5. (a) (i) Find the 15th term of the following arithmetic sequence: 0.9, 0.7, 0.5, ...

- (ii) Given the sequence: 90, 86, 82, ..., -26, find the number of terms.

(iii) Mr. Okutoyi was employed in January 2009 for a salary of sh. 6,000,000 p.a. If his salary was increased annually by sh. 150,000, find his annual salary in 2025.

(b) (i) Find the number of terms in the following sequence: $32, -16, 8, \dots, -\frac{1}{16}$

(ii) The third term of a geometric sequence is 18 and the 6th term is 486. Find the first term and the common ratio. **15 marks**

6. (a) Solve for x: (i) $\log(2x+4) = \frac{1}{2} \log 2$ (ii) $\log(3x-1) = \log(x+13) - \log 2$

(b) Simplify: (i) $\log_{10} 8 + \log_{10} 125$ (ii) $\log_6 1296 - \log_6 36$

(c) A car was bought for sh. 6,000,000. Every year, it reduces by 5%. Find how long it will take its value to reduce to sh. 3,000,000? **15 marks**