THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2016

MA001 – BASIC MATHEMATICS

For candidates applying for Architecture and Building, Business Studies, communications for Development Studies or Property Studies.

TIME ALLOWED: 2 HOURS

INFORMATION FOR CANDIDATES

1. Print and sign your name below, and tick a box to indicate the type of course for which you are applying.
2. All answers must be written in this booklet.
3. Show your workings where required.
4. Do not use red ink or pencil to write this exam.
5. **Calculators are NOT allowed in the examination room.**

Surname: _____ First name: _____

Signature: _____ Date: _____ Venue: _____

Tick the type of course for which you are applying.

[ ] Architecture and Building

[ ] Business Studies

[ ] Communications for Development Studies

[ ] Property Studies

SECTION A: Short Answer Questions – Workings not required

For the following expressions, write the correct answer in the spaces provided on the far right for each question. Each part is worth 2 marks.

1. $\sqrt{16 \times 36 \times 81}$ **Ans:** _____

2. $10 + \sqrt{(-25)}$ **Ans:** _____

3. $-4 + \left(\frac{1}{2}\right)^{-3} - \frac{1}{2^{-2}}$ **Ans:** _____

4. $-3 \times 12 \div 6 + 3(8-3)$ **Ans:** _____

5. $8\frac{2}{3} - 2\frac{2}{3} - 2^3 + 2$ **Ans:** _____

6. $11 - 12 \div 4 + 3 \times (6-2)$ **Ans:** _____

7. $\left(2\frac{1}{2} - 1\frac{1}{3}\right) \div 1\frac{5}{9}$ **Ans:** _____

8. $-(2)^{-3} \times (-2)^3$ **Ans:** _____

9. $-1\frac{1}{3} + \frac{3}{2} \times 1\frac{1}{3} \div 3^{-1}$ **Ans:** _____

10. Simplify as much as possible $\frac{18x^2y^2z}{6xyz^{-2}}$. **Ans:** _____

11. $\sqrt[3]{3^3} \div 2^{-2}$ **Ans:** _____

12. $64^{\frac{1}{3}} \times 2^{-3}$ **Ans:** _____

13. $\sqrt[3]{8} \times 16 \div \sqrt[5]{32}$ **Ans:** _____

SECTION B: Workings required

Show workings for each question and write your final answer in the spaces provided on the far right for each question. Each part is worth 2 marks.

1. A width of a rectangular room is 2 meters shorter than its length. If the perimeter of this room is 24 meters.

(a) Form an **equation** (do not solve) to calculate the perimeter of this rectangular room. Let p denote perimeter and l denote its length. **Ans:** _____

(b) From your solution in (a) above, calculate its width. **Ans:** _____

2. A first basket contains x apples while a second basket contains y apples. The contents of the two baskets are shared equally between c boys. How many apples does each boy receive in terms of x, y and c?

Ans: _____

3. For the following equations, solve for the unknowns..

(a) $-4 = \frac{2}{3w} - 5$ **Ans:** _____

(b) $\frac{5x}{6} - 3 = -\frac{1}{2} + 2x$ **Ans:** _____

(c) $-\frac{3}{5} + \frac{y}{10} = -\frac{1}{5} - \frac{y}{5}$ **Ans:** _____

4. Answer the following questions.

(a) Nelwin has 25 coins. Some are ten toea and some are 5 toea coins. How many of each kind does Nelwin have if its value is K1.75? **Ans:** _____

(b) The profit of a business is K1500. It is shared between three partners, namely Kambiri, Tepou and Yango. Kambiri received $2/5$ while Yango received $2/10$ of this profit. Calculate the amount of money received by Tepou. **Ans:** _____

5. Four friends, namely Ali, Lirix, Jay and Kay contributed sums of money into an organization in the ratio 2:3:3:4 respectively. If Kay contributed K10.

(a) What was the total amount contributed? **Ans:** _____

(b) What was the smallest amount contributed? **Ans:** _____

(c) How much did Lirix contribute? **Ans:** _____

6. If 8% of the sum of money is equal to K9.60. How much is 50% of this money?
Ans: _____

7. If 15 kg of apples costs K3.00, calculate the cost of 5 kg of apples. **Ans:** _____

8. Make k the subject of the formula for $p = \dfrac{\sqrt{k-1}}{x+1}$. **Ans:** _____

9. Given the equation $a = \sqrt{\dfrac{b}{b+c}}$ answer the following questions.

(a) Make b the subject of the formula. **Ans:** _____

(b) Solve for b when $a = 5$ and $c = 3$. **Ans:** _____

10. For the equation $p = 2k^2 \times f^{-2}$, evaluate p when $k = \dfrac{2x}{y}$, $f = \dfrac{3}{x-y}$. **Ans:** _____

11. Solve the simultaneous equation $2x - y = 2$ and $x + y = -5$..

Ans: $x =$ _____ $y =$ _____

12. Continue the sequence of numbers by adding two terms.

2 3 5 9 _____ _____

13. Think of a rectangle having an area of $72cm^2$ whose base is twice its height.

(a) Calculate the length of the base. **Ans:** _____

(b) Calculate its height. **Ans:** _____

(c) Calculate its perimeter. **Ans:** _____