THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2017

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 each of the following questions, write the correct answer in the spaces provided on the far right. Each part is worth 2 marks.

1. How long would it take an investment of K1500 at 20% simple interest to double its value? **Ans:**_____

2. Simplify $\frac{6ab}{c} \times \frac{ad}{2b} \div \frac{4bc}{8cd^2}$. **Ans:**_____

3. $(2a-3b)^2-(a-b)^2$ is equal to **Ans:**_____

4. Solve the equation $\frac{2x}{5}=\frac{x}{8}+\frac{1}{2}$ for x. **Ans:**_____

5. A girl is x years old now. How old was she 3 years ago? **Ans:**_____

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

7. A girl spends $\frac{3}{4}$ of her pocket money and had 90 toea left. How much did she have at start? **Ans:**_____

8. What is the value of $9\times\sqrt{1\frac{7}{9}}$? **Ans:**_____

9. Work out the value of $[15\times(-3)\times 2]\div[(-5)\times(-6)]$. **Ans:**_____

10. Solve the equation $x^2+2x-3=0$ for x. **Ans:**_____

11. Find the value of p for which $25^{p+3}=5^{-p}$. **Ans:**_____

12. Simplify $\left(5a^3bc^4\right)^2$. **Ans:**_____

13. Evaluate $16^{\frac{3}{4}}$. **Ans:**_____

14. Evaluate $\sqrt[3]{64} \times 16^{-\frac{1}{2}}$. **Ans:**_____

15. Find two numbers having sum of 15 and a difference of 5. **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 3 marks.

1. A rectangular room is 2 meters longer than its width. If the perimeter of the room is 24 meters, calculate its width. **Ans:**_____

2. Using the equation $T = 2\sqrt{\dfrac{x^2 + y^2}{hy}}$, answer the following questions.

   (a) Solve for T when $x = y = 2^{-1}$ and $h = 4$. **Ans:**_____

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

3. Answer the following questions;

   (a) A straight-line pass through the point $(2,-3)$ and has a gradient of $-\dfrac{2}{3}$. Find the equation of this line in the general form $Ax + By + C = 0$. **Ans:**_____

(b) The line $y = 3x + c$ passes through the point $(4,27)$. What is the value of c?

Ans: _____

4. A bus is travelling with 48 passengers. When it arrives at a stop, x passengers get off and 3 gets on. At the next stop, half the passengers get off and 7 get on. There are now 22 passengers on board. Find x. **Ans:** _____

5. Kambiri left his fortune to his 3 sons, 4 daughters and his wife. Each son received twice as much as each daughter. His wife received K6000, which was a quarter of the money. How much did each son receive? **Ans:** _____

6. Nelwin Angopa can buy either two pencils and three biros for K10 or four pencils and one biro for K5. Find the cost of one biro. **Ans:** _____

7. Kambiri Kipoi sells his car for K850 thus losing 15% of what he paid for it. How much did the car cost him initially? **Ans:** _____

8. Answer the following questions.

(a) Four people can clean the office in 6 hours. How many people would clean the same office in 4 hours? **Ans:** _____

(b) Abby, Pindu, Jethro and Nelwin contributed sum of money to a charitable organization in the ratio of 2:5:5:6. If Nelwin contributed K10, find the amount contributed by Abby.

Ans: _____

(c) Solve $\frac{x-4}{3}-\frac{2x-3}{5}=2$. **Ans:** _____

(d) Paul Pandea buys 50 books. Some costs K5 and the others cost K7. If he spent K290 in total, how many books costing K5 did he buy? **Ans:** _____

(e) Continue the sequence of numbers by adding two terms.

3 8 15 24 _____ _____