THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2014

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: _____

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. $-4-(-5)$ Ans: _____

2. $3-7\times4$ Ans: _____

3. $3\times\left(\frac{1}{2}-\frac{1}{3}\right)$ Ans: _____

4. $7\times6-12\div3+1$ Ans: _____

5. $\frac{-6\times-4}{-2}$ Ans: _____

6. 1^{-36} Ans: _____

7. -3^2 Ans: _____

8. 0^{-100} Ans: _____

9. $-1\frac{1}{3}+\frac{3}{2}$ Ans: _____

10. $-7-11-8+19-13$ Ans: _____

11. $1\frac{2}{3}-\frac{1}{2}+2$ Ans: _____

12. $32^{\frac{1}{5}}\times8^{-1}$ 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. The length and width of a rectangle are represented by l and $2l-20$ meters respectively.

(a) Write the expression for calculating the perimeter of this rectangle.

Ans: _____

(b) From your solution in (a) above, find l when the perimeter is 20 meters.

Ans: _____

2. For the following equations, solve for the *unknowns*.

(a) $2=\dfrac{18}{w+4}$ Ans: _____

(b) $\dfrac{5}{x+5}=\dfrac{15}{x+7}$ Ans: _____

(c) $\dfrac{y}{3}+\dfrac{y}{4}=1$ Ans: _____

3. Answer the following questions.

(a) Two lengths are in the ratio $5:3$. If the first length is 50m, what is the total length?

Ans: _____

(b) Divide K80.00 in the ratio $5:3$.

Ans: _____

4. 22% of a certain length is 22cm. What is the complete length?

Ans: _____

5. An increase of 10% in a salary makes weekly wage bill for a factory to K22000. Use this information to answer the following questions.

(a) What was the wage bill before the increase?

Ans: _____

(b) What is the amount of the increase?

Ans: _____

6. Find an expression which will give the total mass of a box containing x articles if the box has a mass of 7 kilogram and each article has a mass of 1.5 kilogram.

Ans: _____

7. Given the equation $v = \sqrt{2gh}$, answer the following questions.

(a) Make h the subject of the formula.

Ans: _____

(b) Find the value of h when $v = 4$ and $g = 8$.

Ans: _____

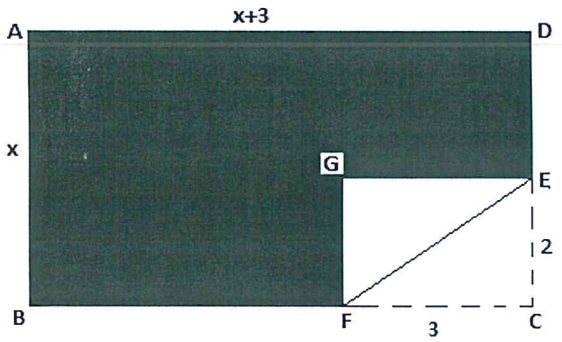
8. Solve the simultaneous equation $3x + 4y = 11$ and $x + 7y = 15$.

Ans: _____

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

2 5 10 17 _____ _____

10. The diagram represents a rectangular piece of paper ABCD which has been folded alone EF so that C has moved to G.



1. All lenghts are in centimeters
2. AB=x centimeters
3. AD= x+3 centimeters
4. CE=2 centimeters
5. CF=3 centimeters

(a) Calculate the area of triangle ECF.

Ans: _____

(b) Find an expression of the shaded for the shaded area ABFGED in terms of x.

Ans: _____

(c) Given that the shaded area is $20\,cm^2$, show that $x(x+3)=26$.

Ans: _____

(d) From the equation solved in (c), calculate the length and width.

Ans: _____