THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2015

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. $(-24) \div -4 - 24 \div 6$ **Ans:** _____

2. $8 \times 5 - 15 - 5 + 7$ **Ans:** _____

3. $11^{-1} \times \left(\left(\frac{1}{2} \right)^{-2} - \frac{1}{3} \right)$ **Ans:** _____

4. $10 - 12 \div 6 - 3(8 - 3)$ **Ans:** _____

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

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

7. $\left(\frac{1}{2} \right)^{2} + \frac{3}{4} - \frac{-2^2}{3} \times \frac{1}{6} \div 3^{-2}$ **Ans:** _____

8. $-(2)^3 - (-2)^3$ **Ans:** _____

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

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

11. $\sqrt[6]{8^2} \div \frac{1}{4}$ **Ans:** _____

12. $32^{-\frac{1}{5}} \times 8^{-1}$ **Ans:** _____

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

14. Subtract $3x^2 - 5x + 6$ from $2x^2 - 2x - 3$. **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 rectangular room is 2 meters longer than its width. If the perimeter of the room is 24 meters.

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

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

2. The price of a packet of rice after VAT is K5.80. What was the price before VAT?

Ans: _____

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

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

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

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

4. Answer the following questions.

(a) Nelwin spends 5/8 of his lunch money and has 60 toea left. How much money did he have at start? **Ans:** _____

(b) The profit of a business is K500. It is shared between two partners Peter and Gande. If Peter receives 2/5 of the profit, how much money does Gande receive? **Ans:** _____

5. A certain amount of money was shared amongst Jethro, Nelwin and Abby in the ration of 5:3:2 respectively. Abby received K120.

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

(b) How much did Nelwin received? **Ans:** _____

(c) How much did Jethro received? **Ans:** _____

6. 8% of the sum of money is equal to K9.60.

(a) What is the sum of money? **Ans:** _____

(b) Calculate 92% of this sum of money? **Ans:** _____

7. Pindu has 20 coins, some 50 toea coin and some K1 coin. The total value of these coins is K15. Find the number of 50 toea coin. **Ans:** _____

8. 800 tickets were sold for a 'pop' concert some costing K9 and some costing K12. The total cash received was K8550. Find the number of cheaper tickets sold. **Ans:** _____

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

10. Given the equation $T = 2\sqrt{\frac{k^2+h^2}{gh}}$, answer the following questions.

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

(b) Solve for k when $T = 5$, $g = 8$ and $h = 3$. **Ans:** _____

11. For the equation $p = 2k^2 \times f^{-2}$, evaluate p when $k = \frac{2x}{y}, f = \frac{3}{x-y}$.

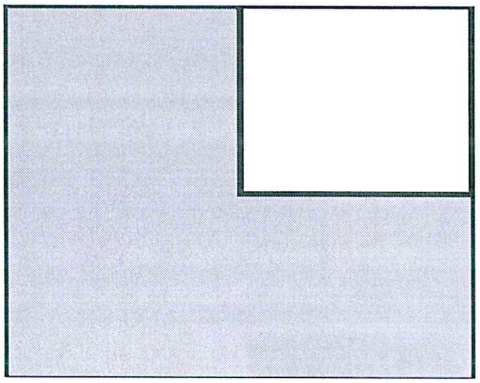
12. Solve the simultaneous equation $x-2y=6$ and $5x+7y=-4$.

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

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

2 5 11 23 _____ _____

14. The side of the small square (unshaded) is half the length of the side of the large square. The L-shape has an area of $75cm^2$.



(a) Find the side length of the large square. **Ans:** _____

(b) Find the side length of small square (unshaded). **Ans:** _____

(c) Find the area of the small square (unshaded). **Ans:** _____