THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2018

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: Multiple Choice Questions

Circle the correct choice for each question. Each part is worth 3 marks.

1. When a patrol tank on a car is 70% full, it contains 35 litres. How much does the tank hold when full?

   A. 45 litres B. 25 litres C. 50 litres D. 45.5 litres

2. Evaluate $\left(1\frac{1}{3}\right)^2 - \sqrt{2\frac{7}{9}}$

   A. $\frac{1}{9}$ B. $-\frac{1}{9}$ C. $-\sqrt{\frac{1}{9}}$ D. $\sqrt{\frac{1}{9}}$

3. Evaluate $2\frac{3}{4} \times \frac{4}{5} \div -1\frac{6}{5}$

   A. -0.10 B. 0.10 C. -1 D. 1

4. Evaluate $\sqrt{2\frac{1}{4} \times 2\frac{7}{9}} \div \sqrt{6\frac{1}{4}}$

   A. 10 B. 1 C. -10 D. -1

5. Simplify the expression $\left(a^{-4} \div b^{-3}\right)^{-2} \div \left(a^3 \times b^2\right)^3 \times \frac{1}{\left(a^2 b^6\right)^{-2}}$.

   A. $\frac{1}{ab^{12}}$ B. ab^{12} C. $\frac{1}{a^3}$ D. a^3

6. Solve the expression $4x^{-2}(3+5y^{-2}) + 2y(7x^2+1) + y^{-1}(4x^{-1}-3)$ when $x=1$ and $y=-1$.

   A. 5 B. 10 C. 15 D. 20

7. If $p=2,\ q=0,\ r=-3,\ x=p-r$ and $y=q-r$, evaluate $(2xy-3p)-(x-y)$.

   A. -16 B. -12 C. 14 D. 16

8. A consignment of perishable goods weighs 300 kilogram. If 30% of the consignment is unsaleable, what weight is saleable?

   A. 210 kg B. 220 kg C. 200 kg D.250 kg

9. Find the equation of the straight line which passes through the point $(-1,3)$ and is parallel to the straight line joining the points $(2,1)$ and $(5,5)$.

   A. $3x-4y+13=0$ B. $4x-3y+13=0$ C. $4x+3y-13=0$ D. $3x+4y-13=0$

10. Make x the subject of the formula for $\frac{f(nx-y)}{c} = n$.

    A. $x=\left(\frac{fc}{c}-y\right)\div n$ B. $x=\left(\frac{nc}{f}+y\right)\div n$ C. $x=\left(\frac{nc}{f}-y\right)\div n$ D. $x=\left(\frac{yc}{f}+n\right)\div n$

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 trade store sells two types of noodle; Eagle Noodle at K1.50 and Kakaruk Noodle at K1.00. If you take K20 into this trade store and purchase some packets of each type of noodles;
   a) Find the formula for the change you will receive after the purchase.

   Ans: _____

   b) Use the formula in (a) to find the change you will receive if you purchase 4 packets of Eagle Noodles and 5 packets of Kakaruk Noodles.

   Ans: _____

   c) If you purchase 7 packets of Eagle Noodles and certain number of Kakaruk Noodles and come out of the store with K7.50, How many packets of Kakaruk Noodles did you purchase?

   Ans: _____

2. A sum of money is divided into 3 parts in the ratio 2:4:5. If the largest share received is K40, calculate the smallest share amount received.

   Ans: _____

3. If 15 kilograms of apple costs K30, calculate the cost of 40 kilograms of apple.

Ans: _____

4. A farmer employs 12 men to harvest his potato crop. They take 9 days to complete the work. If the farmer had employed 8 men, how long would it have taken them?

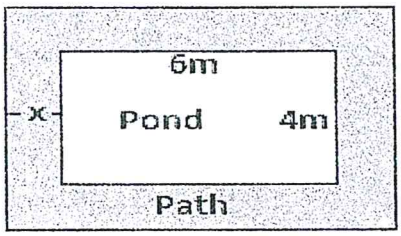
Ans: _____

5. Peter is 3 years older than Jack while Eddy is one year older than Max. If Max is 2 years younger than Peter, calculate the actual age of Jack, Eddy and Max if Peter's age is 29.

6. A car travels for 4 hours at an average speed of 64km/h. For the first 2 hours, its average speed is 50km/h. What is its average speed for the last 2 hours?

Ans: _____

7. A rectangular pond, $6m \times 4m$, is surrounded by a uniform path of width x. If the area of the path is equal to the area of the pond,



a) Find x. **Ans:** _____

b) Find the perimeter of the path. **Ans:** _____

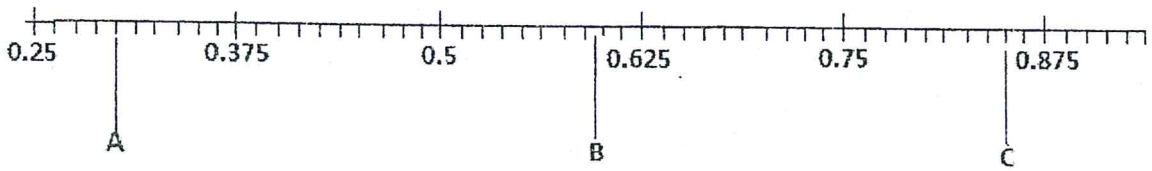
8. Write down the next three terms of the sequence 5, 8, 11, 14, 17, ____, ____, ____.

9. Find the equation of the straight line which passes through the point of intersection of $5x-y-3=0$ and $2x-y=0$ and which is perpendicular to the straight line $4x+3y-2=0$.

Ans: _____

10. Rewrite in ascending order of its value: $0.125, \frac{2}{3}, 1\frac{2}{3}, 0.0125, 1\frac{-2}{3}, \frac{1}{5}, 1.250, -1\frac{1}{5}$.

11. Write the values represented by **A**, **B** and **C** for this scale.



Ans: A=_____ B=_____ C=_____