THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

ENTRANCE EXAMINATIONS – 2019

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

For Questions 1 to 21, circle the correct choice. Each question worth 2 marks.

1. Consider the numbers; 11, 21, 31, 77 and 121. Three of these numbers have a common factor of
   A. 2 B. 7 C. 11 D. 14

2. Which set of numbers does 0.50 belonged to?
   A. Integers B. irrational numbers C. whole numbers D. rational numbers

3. How much would you pay for a 1 kilogram trukai rice if a packet weighing 125 grams cost 21 toea?
   A. K1.84 B. K1.67 C. K1.68 D. K1.71

4. A car has a patrol consumption of 12km per litre. How many complete litres of patrol will be needed for a journey of 200 km?
   A. 15 B. 16 C. 17 D. 18

5. Nel scored 70% in a test. What was Nel's mark if the maximum mark was 40?
   A. 28 B. 30 C. 32 D. 36

6. If $x+3=\frac{5x}{2}$, the value of x is
   A. 0 B. 2 C. 6 D. 8

7. Four times a certain number plus one-third is equalled to three times the number plus twenty. Find the number.
   A. $\frac{1}{3}$ B. $\frac{5}{3}$ C. $\frac{9}{3}$ D. $\frac{59}{3}$

8. First basket contains x apples while a second basket contains y apples. The content of two baskets are shared equally between z boys. How many apples does each boy receive?
   A. $x+y=\frac{z}{2}$ B. $z=\frac{1}{2}(x+y)$ C. $\frac{x+y}{z}$ D. $\frac{1}{2}(x+y+z)$

9. Yarea Kambiri borrows K4,000 for a period of 6 years at 20% simple interest per annum. The amount of simple interest payable on this loan would be
   A. K1,800 B. K2,800 C.K3,800 D. K4,800

10. Transpose the formula $V=\frac{2R}{R-r}$ to make R the subject of the formula.
   A. $R=\frac{Vr}{V-2}$ B. $R=\frac{V-2}{V-r}$ C. $R=\frac{2V}{V-r}$ D. $R=\frac{Vr}{2-V}$

11. Find the value of x which satisfies the equations $4x+y=23$ and $3x-y=12$.
A. 2 B. 3 C. 4 D. 5

12. The value of $81^{\frac{1}{4}}$ is
A. 3 B. $\frac{81}{4}$ C. $\frac{2}{3}$ D. 2

13. The value of x when $5^{2x+3}=125^{x+5}$ is
A. 12 B. -12 C. 8 D. -8

14. The value of x when $\log x^2-\log 10=3$ is
A. 2 B. 20 C. 100 D. 10

15. What is the equation of a straight line that passes through the origin and whose gradient is 2?
A. $y=0$ B. $y=2x$ C. $y=-2x$ D. $y=0.5x$

16. $\frac{-3\times(-4)\times(-2)}{(-2)\times(6)}$ is equalled to
A. 0 B. 1 C. 2 D. 3

17. $\left(2\frac{1}{4}\times 4\frac{2}{3}\right)+1\frac{1}{2}-12$ is equalled to
A. 0 B. 1 C. 2 D. 3

18. $\sqrt{2\frac{1}{4}\times 2\frac{7}{9}}\div\sqrt{6\frac{1}{4}}$ is equalled to
A. 0 B. 1 C. 2 D. 3

19. Maia, Kauwo and Poloko shared a project fund in the ratio 2:3:5 respectively. If Maia receive K5,000, how much did Poloko received?
A. K12,000 B. K12,250 C. K12,500 D. K12,550

20. 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.
A. $15x+7$ B. $1.5x+7$ C. $7x+15$ D. $7x+1.5$

21. After an increase of 10%, the price of a bike is K1,210. What was the price before the increase?
A. K1,000 B. K1,010 C. K1,100 D. K1,110

Section B: Workings Required For Full Mark

For Questions 22 to 26, show full workings. Each question worth 6 marks.

22. A box has a square base of 5cm and a height of 10cm. Calculate the volume of this box if its length and the width of the base and its height is increased by 10%.

23. Given that a triangle has vertices at $(1,1)$, $(5,3)$ and $(3,5)$. Find the area of this triangle.

24. $(x-1)$, x and $(x+1)$ represents three positive integers. The product of the three numbers is five times their sum. Find the three positive integers.

25. An increase of 10% in a salary makes weekly wage bill for a factory to be K22,000. What is the amount of the increase?

26. Nelwin Angopa can buy either 2 televisions and 3 video-recorders for K1,750 or 4 televisions and 1 video-recorder for K1,250. Find the cost for one of each.