University of Fort Hare

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UNIVERSITY OF FORT HARE

MATHEMATICS EDUCATION 2
MTH212E

JUNE

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Time	**3 hours**
Subject	**Mathematics**
Marks	**100**

This paper consists of 8 pages, including cover page

Internal Examiner

Ms. Z.F. Qwesha

Internal Moderator

Ms. N. Bambiso

Instructions

1. This paper is divided into SECTION A, B and C
2. All the questions are compulsory.
3. You are expected to use your OWN words and understanding.

Section A

All the statements in this section are False. Re-write them to make them true. [20]

1. The numbers 4,6,8,10 and 90 are prime numbers. [1]
2. [All the factors of 36 are 1, 2,3,4,6,9,12,18 and 37. [1]
3. All whole numbers are natural numbers. [1]
4. The correct answer to 7(3+5)- 4(12-5) is -17. [1]
5. The numbers 41,43,47 and 53 are all examples of even numbers. [1]
6. The product of 12 and 15 is 27. [1]
7. The sum of 50 and 12 is 600. [1]
8. The dividend is the number we obtain when we divide one number by another number. [1]
9. National curriculum Statement Assessment (NCSA) document is the detailed guideline of what to teach and assessed on a grade-by-grade basis. [1]
10. In the calculation: 8-3x(6+4), the first step is to subtract 3 from 8. [1]
11. The numbers 9, 36, and 121 are all examples of cube numbers. [1]
12. The factors of 21 are 1,2, 3,4, 7, and 21. [1]
13. The number 23 822 106 is eight hundred and twenty-two more than 23 622 106. [1]
14. Progression in the NCSA document is a tool used by teachers to check where learners are at in their learning. [1]
15. 81 is 3^4 or 9^3 [1]
16. The place value of 5 in 23 574 is five hundred thousand. [1]
17. The Sumerians were the first civilization to invent different symbols for different numbers. [1]
18. Integers (Z). This is the set of all the negatives numbers including zero. [1]
19. Cube numbers are made by multiplying a number by itself once. [1]

20. Square numbers are made by multiplying a number by itself twice. [1]

SECTION B

On the following questions select one option: A, B, C OR D. [20]

1. The number sequence: 8, 27, 64, 125.... Is a list of:
   A. Odd numbers
   B. Cube numbers
   C. Skip jumping
   D. None of the above [1]
2. Multiple Intelligence theory comes from the work of:
   A. Piaget
   B. Gardner
   C. Erikson
   D. Donaldson [1]
3. Which of the following is not one of the original Multiple Intelligences?
   A. Interpersonal intelligences
   B. Visual-spatial intelligences
   C. Intrapersonal intelligences
   D. Emotional intelligences [1]
4. Which if the following is the founder of Constructivism
   A. Dewey
   B. Erikson
   C. Gardner
   D. Piaget [1]
5. Which multiple intelligence involves the successful manipulation of words and Phrases to convey ideas, feelings, and moods.
   A. Logical Intelligence
   B. Visual Intelligence
   C. Verbal Intelligence
   D. Intrapersonal Intelligence [1]

6. One of the following is <u>not</u> an ICT tool for teaching mathematics.

   A. Database
   B. Spreadsheets
   C. Interactive Whiteboards
   D. Stickers [1]

7. The sum of two numbers is 144. One number is five times bigger than the other number. The two numbers are:

   A. 132 and 12
   B. 95 and 49
   C. 120 and 24
   D. 108 and 36 [1]

8. The distributive property suggests that 6x 204 is the same as

   A. 6 + 200 x 6+ 4
   B. 6 x 200 +6 x 4
   C. 2 x 200 + 4 x 4
   D. None of the above [1]

9. Which one of the following is <u>not</u> correct.

   A. 13,5 + 0 = 13,5
   B. 0 x 45 + 0=0
   C. 0 ÷ 0 = 0
   D. 0 – 32,5 = -32,5 [1]

10. 4+ 5 = 5 + 4 is an example of a :

   A. Commutative property
   B. Distributive property
   C. Associative property
   D. None of the above [1]

11. Which of the following operations are the inverse of each other

   A. Multiplication and subtraction
   B. Subtraction and division
   C. Addition and subtraction
   D. Addition and multiplication [1]

12. Which number is the identity element for addition:

A. 1
B. 0
C. 10
D. 5 [1]

13. In the numeric pattern 5,8, 11,14…The number 5 is the….

A. Second term
B. Third term
C. First term
D. Fifth term [1]

14. The constant difference is when you…..

A. Add or subtract the same number repeatedly.
B. Multiply or divide the same number repeatedly.
C. Multiply or add the same number repeatedly.
D. Divide or subtract the same number repeatedly. [1]

15. The constant ratio is when you…..

A. Add or subtract the same number repeatedly.
B. Multiply or divide the same number repeatedly.
C. Multiply or add the same number repeatedly.
D. Divide or subtract the same number repeatedly. [1]

16. The general rule in the following sequence 3,6,12, 24,48

A. Add 3
B. Add 3 and 6
C. Multiply by 2
D. Multiply 3 [1]

17. The next term in the following sequence 10,15,20,25…is

A. 26
B. 30
C. 35
D. 45

18. In the following 5x20-5x10, the shorter expression is

A. 5(20-10)
B. 20(10-5)
C. 10(20-5)
D. 20(5x10) [1]

19. Multiplying numbers is called finding the…

A. Sum
B. Quotient
C. Product
D. Difference [1]

20. The number 1 is the identity element for

A. Addition
B. Subtraction
C. Division
D. Multiplication [1]

SECTION C [60]

1. Using the inverse operation to check solutions is one of the reasons to teach addition and subtraction simultaneously. Use the following numbers to show the inverse operation of addition and subtraction:

a) 54 687- 32 134 **[4]**

b)45 362+ 32 488 **[4]**

2. Show a Grade 6 learner how to solve the same problem by doing two operations. Read the following problem and use the operations that are applicable.

a) Anna has 5 egg cartons. Each carton had 12 eggs. How many eggs does she have in total. **[4]**

b) The number range in multiplication in grade 5 can be increased to 4-digit by 3-digit. Give an example of a 4-digit by 3-digit number. **[2]**

3. Make two number sentences to show the properties of 1 using this number: **245**

a) multiplication **[1]**

b) division **[1]**

c) addition **[1]**

d) subtraction **[1]**

4. Input-output diagrams in the Intermediate are shown using flow diagrams. Explain to a grade 6 learner how to represent numeric patterns into flow diagrams using the inputs, outputs, and the rules.

a) Inputs: 1, 3, 5, 9, 11

Rule: x4+1 **[5]**

b) Outputs: 25,75,200,250, 300

Rule: x100÷4 **[5]**

5. The table below shows a phase overview of specification content for Grade 4,5 and 6 in Mathematics. Read the table and answer the following questions:

Topic	Grade 4	Grade 5	Grade 6
Numeric patterns	Investigate and extend patterns. ▪ Investigate and extend numeric patterns looking for relationships or rules of pattern. - sequences involving a constant difference or ratio - Of learner's own creation ▪ Describe observed relationship or rules in learner's own words.	Investigate and extend patterns. ▪ Investigate and extend numeric patterns looking for relationships or rules of pattern. - sequences involving a constant difference or ratio - Of learner's own creation • Describe observed relationship or rules in learner's own words.	Investigate and extend patterns. ▪ Investigate and extend numeric patterns looking for relationships or rules of pattern. - sequences not limited to a constant difference or ratio - Of learner's own creation - Represented in tables. • Describe the general rules for the observed relationships

a) Give the Content Area of the above topic. **[2]**

b) Explain the similarities of the content in this phase. **[4]**

c) Describe the progression in the phase. **[2]**

d) Explain in your own words what do we mean by progression in the topic? **[2]**

6. Explain the following mathematics concepts in a Grade 6 class by describing and create the pattern and give examples in each:

a) constant difference **[6]**

b) constant ratio **[6]**

7. The numbers required for division in grade 6 can become difficult for a grade 6 learner to use. Explain how you are going to teach long division to a Grade 6 learner using these numbers: 3 848 ÷ 132. **[10]**