



UNIVERSITY OF NAMIBIA

FACULTY	Education and Human Sciences		
DEPARTMENT	Intermediate and Vocational Education		
COURSE	Mathematics Education 1A		
COURSE CODE	E3511IM		
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DURATION	3 hours	MARKS	100

FIRST OPPORTUNITY EXAMINATION

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INSTRUCTIONS

- Answer each question on a separate answer sheet, using a **blue/black pen**.
- All the working and calculations needed must be clearly shown to obtain full marks.
- Number your questions correctly and clearly as indicated in the question paper.
- Calculators are **NOT** allowed.
- **This paper consists of 4 pages including the cover page**

SECTION A (Multiple choice questions)

Choose the correct answer by writing down the number and the correct letter only, e.g. 1. A.

1. Which ancient civilisation used the base 60 number system? [2]
A. Egyptian B. Indian C. Mayan D. Babylonian
2. The set of all irrational numbers is contained in the following set: [2]
A. complex numbers B. natural numbers C. integers D. rational numbers
3. Which of the following numbers is not divisible by 3? [2]
A. 6189 B. 2475 C. 6767 D. 6237
4. The real number part of the complex number $47i$ is: [2]
A. i B. 47 C. 0 D. $47i$
5. The Roman numeral MCCCLIX is equivalent to: [2]
B. 1361 B. 1359 C. 1349 D. 1341
6. How many digits are in the product of $103\,452 \times 314$ [2]
A. 10 B. 7 C. 9 D. 8
7. The number $32\,457.8$ expressed in scientific notation to the nearest hundred is: [2]
A. 324.56×10^5 B. 3.245×10^5 C. 3.25×10^5 D. 300.25×10^5 [2]
8. In binary arithmetic, $1011_2 - 111_2$ is equal to: [2]
A. 1110_2 B. 1100_2 C. 1001_2 D. 1101_2
9. If $x = -2$ and $y = 4$, what is the value of $\frac{3(4x-y)}{2x+2y}$? [2]
B. 3 B. -3 C. -9 D. 9
10. Which one of the numbers listed below is not in base 6.
A. 355421_6 B. 547315_6 C. 0 D. 432355_6

[20]

SECTION B (Structured questions)

Answer all the questions in this section.

Question 1

- 1.1 Consider the number $24\text{9}249$ and state the *value* and *place value* of the underlined digit [2]
- 1.2 Convert 1349 to Roman numerals. [3]
- 1.3 Convert 378 to a hexadecimal number. [4]
- 1.4 Simplify:
- 1.4.1 $(x^4)^{\frac{3}{2}}$ [3]
- 1.4.2 $\frac{1}{2}(\sqrt{-64})$ [3]
- 1.5 Evaluate:
- 1.5.1 $(\sqrt{4} - 5)(\sqrt{4} + 5)$ [2]
- 1.5.2 $MMC + DXL - VII$ and express the answer in Roman numerals. [3]
- [20]**
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Question 2

- 2.1 Briefly explain the following concepts using valid examples.
- 2.1.1 the additive identity of real number. [2]
- 2.1.2 the multiplicative identity of real numbers. [2]
- 2.2 Write down the formula of the associative property of real number addition. Then using arithmetic, demonstrate that the associative property holds true when the numbers 20, 16 and 24 are added together. [4]
- 2.3 Calculate the product of 235 and 12 by using partitioning and the grid multiplication methods respectively. [6]
- 2.4 Calculate the product of $221_6 \times 15_6$ using any approach that you prefer and express the result in base 6. [6]
- [20]**
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Question 3

Simplify the expressions below:

3.1 $\left(\frac{2x^2y^5}{4xy^4}\right)^{-2}$ (express your result with positive exponents) [5]

3.2 $\frac{(125x^{-1})^{\frac{1}{3}}}{(100x^2)^{-\frac{1}{2}}}$ [4]

3.3 $\frac{4^{n+1} \times 8^{n+1}}{16^{n+1}}$ [5]

3.4 $^2\sqrt{^4\sqrt{256}} + (-5)$ [3]

3.5 Show that $a^0 = 1$ for any real number a . [3]

[20]

Question 4

Solve the exponential equations below:

4.1 Consider the following numbers: $\frac{1}{3}$, $-\frac{3}{4}$, 1 , $\sqrt{3}$, $\sqrt[3]{125}$, and identify:

4.1.1 a cube number [1]

4.1.2 an irrational number [1]

4.1.3 two integers [2]

4.2 Rationalise the denominator in the fraction $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ [3]

4.3 $16^{x-3} = (16)4^x$ [4]

4.4 $5^{2x+1} + 25^x = 30$ [6]

4.5 State any three (3) reasons why it is important that Grade 4 -7 learners develop mental calculation skills. [3]

[20]
