



UNIVERSITY OF JOHANNESBURG
FACULTY OF EDUCATION

AUGUST EXAMINATION 2018

PROGRAMME: B Ed Intermediate Phase programme

MODULE: Mathematics for the Intermediate Phase

CODE: MATINA2

TIME: 2 hours 30 minutes

MARKS: 100

EXAMINERS: Mrs K Fonseca

MODERATOR: Prof C Long

(This paper consists of 6 pages)

INSTRUCTIONS:

Read the following instructions carefully before answering the questions.

1. This question paper consists of 5 questions.
2. Answer all the questions.
3. Number the questions correctly as in the question paper.
4. Read each question carefully before answering.
5. Show ALL working out.
6. You may **NOT** use a calculator.
7. Write **NEATLY** and **LEGIBLY**.

Question 1: Multiple Choice

8 marks

1.1 Subtract: $6\,000 - 2\,369$

(1)

A. 4 369

B. 3 742

C. 3 631

D. 3 531

1.2 Which of these numbers is the smallest number?

(1)

A. 0,625

B. 0,5

C. 0,25

D. 0,125

1.3 At school A, a bell rings every half an hour and at school B a bell rings every 35 minutes. If the two bells ring together at 08:00, at what time will they ring together again? (1)

A. 10:30

B. 10:55

C. 11:30

D. 12:00

1.4 The first odd number is 1, the second is 3 and the third one is 5. What is the hundredth odd number? (1)

A. 99

B. 201

C. 199

D. 101

1.5 Which of these fractions is smallest?

(1)

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{6}$

D. $\frac{1}{2}$

1.6 What is the Highest Common Factor (HCF) of 12, 16, 24, 40?

(1)

A. 3

B. 4

C. 8

D. 12

1.7 Divide:

(1)

$$0.003 \overline{)15.15}$$

A. 0,515

B. 5.15

C. 5150

D. 515

1.8 $2 \times (6 + 8) + 8 \times (6 + 8)$

(1)

A. 38

- B. 76
- C. 96
- D. 140

Question 2

17 marks

- 2.1 Let $a = 2^3 \cdot 3^1 \cdot 7^2$
- 2.1.1 Is $2^2 \cdot 7^1 = 28$ a factor of a ? Why or why not? (2)
- 2.1.2 Is $2^1 \cdot 3^2 \cdot 7^1 = 126$ a factor of a ? Why or why not? (2)
- 2.1.3 One factor of a is $b = 2^2 \cdot 3^1$. What is the quotient when a is divided by b ? (3)
- 2.2 A learner claims that 157 163 is divisible by 3 since the last digit in the number is 3. Explain how you would correct the learner's thinking. (3)
- 2.3 Determine the LCM of 360, 900 and 250. (4)
- 2.4 Ms Chauke's learners are working on the following problem: (3)

Is 371 a prime number?

As she walks around the room looking at their books, she sees many different ways to solve this problem.

Which solution method is correct?

- A. Check to see whether 371 is divisible by 2, 3, 4, 5, 6, 7, 8 Or 9
- B. Break 371 into 3 and 71 they are both prime.
- C. Check to see whether 371 is divisible by any prime number less than 20.
- D. Break 371 into 37 and 1 they are both prime, so 371 must also be prime.

Explain, why you say so.

Question 3**35
marks**

3.1 Given the list of numbers:

$$4\frac{1}{2}; \frac{6(3-1)}{3}; 7 - \sqrt{64}; 0,316147 \dots; \sqrt{5}; \sqrt[3]{1} - 3; \frac{\sqrt{2}}{2}$$

From the list above select all the:

3.1.1 Natural numbers (2)

3.1.2 integers (3)

3.1.3 Rational numbers (2)

3.1.4 Irrational numbers (2)

3.2 John wrote the following number sentence in a test:

$$12 \div 2 = 2 \div 12$$

3.2.1 State whether John's number sentence is correct. If not write the correct number sentence. (3)

3.2.2 Explain why you say the number sentence is correct or incorrect. (2)

3.3 Calculate the following using the breaking down method: (4)

$$422\,956 - 316\,542$$

3.4.1 Calculate 132×23 using the partial – products algorithm. (4)3.4.2 Lucy is struggling to multiply 3-digit numbers by 2-digit numbers. You decided that you would help her by drawing a rectangular-area-model for 719×24 to help her understand after you have shown her the partial - product algorithm. (5)Illustrate 719×24 in a rectangular-area-model and explain why this model is useful when teaching multiplication of multi-digit numbers.

3.5.1 When two odd numbers are added will the result always be an even number? Use inductive reasoning to determine your answer. (3)

3.5.2 Use representational reasoning to show your answer. (3)

3.5.3 Explain what is meant by a conjecture. (2)

Question 4

**23
marks**

4.1 Determine 3 rational number between $\frac{1}{16}$ and $\frac{3}{16}$. (3)

4.2 Calculate: (4)

$$6\frac{1}{3} + 3\frac{3}{4} - 2\frac{1}{12}$$

4.3 Zanele use $\frac{1}{3}$ of her salary for rent, $\frac{2}{5}$ for groceries and $\frac{1}{4}$ for other expenses. (4)
How much of her salary is left if she earns R4 500.

4.4 Calculate $\frac{1}{4} + \frac{2}{3} =$; illustrate your working out with the aid of fraction strips. (4)

4.5 Illustrate why $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$; using a number line. (4)

4.5 Calculate $\frac{3}{8} \div \frac{2}{5} =$; illustrate your working out with the Rectangular- Area- model. (4)

Question 5

17 marks

5.1 Replace the * by >, < or = to make the sentence true:

5.1.1 $0,04 * 0,03$ (1)

5.1.2 $\frac{1}{3} * 0,3$ (2)

5.1.3 $\sqrt[3]{0,125} * \frac{1}{2}$ (2)

5.2 Round the following decimal fraction to the nearest thousandth: (2)

8,3922

5.3 Express $\frac{5}{6}$ as a decimal fraction (2)

5.4 When asked to perform the decimal computations $3,6 \times 0,2$ and $8,36 \div 0,4$, some learners submitted the answers shown below:

$$\begin{array}{r} 3.6 \\ \times 0.2 \\ \hline 7.2 \end{array}$$

$$\begin{array}{r} 2.9 \\ 0.4 \overline{)8.36} \end{array}$$

5.4.1 Identify the errors made by each student. (4)

5.4.2 Explain how the learners can avoid making the same errors in future. (4)