MPMAT3B

UNIVERSITY OF JOHANNESBURG
FACULTY OF EDUCATION
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PROGRAMME: Bachelor of Education

MODULE: Teaching Methodology and Practicum for Mathematics

CODE: MPMATB3

TIME: 2 hours

MARKS: 100 marks

EXAMINER: C Long

MODERATOR: Dr Maryna du Plooy (UP)

(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. Label all questions correctly.
3. Write neat and legibly.

Question 1: Whole number.

1.1 A learner was having trouble trying to understand the problem below.

"The government built 253 492 houses in a settlement in one year. At the end of the year there were 913 658 houses in the settlement. How many houses were there at the beginning of the year?"

Describe how you could assist the learner to unpack the problem? Use strategies like estimation, breaking down numbers, drawings, and diagrams to assist the learner. (5)

1.2 One way of doing multiplication is using the expanded column notation. Indira has to calculate 4 385 x 765. She sets her work out as follows;

4 387		4 387		4 387	
X 700		X 60		X 5.	
4 900	a)	.....	e)	.....	i)
56 000	b)	.....	f)	.....	j)
.....	c)	.....	g)	.....	k)
_____	d)	_____	h)	_____	l)
3 070 900	m)	_____	n)	_____	o)

1.2.1 Where did Indira get the numbers 700, 60 and 5 from? (1)

1.2.2 Which two numbers does Indira multiply to get a)? (1)

1.2.3 Which two numbers did Indira multiply to get b)? (1)

1.2.4 What answers does she get at steps c) to l)? (5)

1.2.5 How is the answer 3 070 900 at m) calculated? (1)

1.2.6 How is the final answer to 4 385 x 765 calculated? (1)

1.3 Calculate 4 385 x 765 using a minimum number of symbols. (1)

1.4 Compare the two methods used in 1.2 and 1.3. What are the advantages and disadvantages of each method? Refer to conceptual and procedural understanding. (4)

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Question 2: Fractions, decimals and percentages

2.1 *"A loaf of bread has been cut into 24 equal slices".* The two questions below, can be asked about the same statement. These questions have different mathematical structures.

How many slices will each person get if the loaf is shared between two people? **Answer:** _____	How many people will get bread if two slices are given to each person? **Answer:** _____

2.1.1 Answer each question above in complete sentences. (2)

2.1.2 Write down an imaginary conversation between yourself and a Grade 6 child to find out whether the child understands the difference between these two situations. (5 sentences) (5)

2.2 A Grade 6 class was solving the problem: $1\frac{3}{4} - \frac{2}{5}$.

Two learners solved the problem differently.

Carol	Sipho
$1\frac{3}{4} - \frac{2}{5}$	$1\frac{3}{4} - \frac{2}{5}$
$= 1\frac{15}{20} - \frac{8}{20}$	$=1.75 - 1.40$
$=1\frac{7}{20}$	$=1.35$

2.2.1 Are the answers equivalent? ..... (1)

2.2.2 Explain two methods of testing whether they are equivalent or not? (4)

2.3 Write the number name and place value parts for the number 70, 36 in a way that would make the structure of the number explicit to a Grade 6 child. (4)

2.4 Tom and Jerry used their calculators to multiply 1.2 x 3.6. Tom got 4.32 and Jerry got 43.2.

2.4.1 Whose answer is correct? (1)

2.4.2 What mistake did the other person make? (3)

2.5 Fractions, decimals and percentages are all representations of numbers.

2.5.1 Write five-hundredths in fraction, decimal and percentage form. (3)

2.5.2 What do fractions and decimals have in common? (1)

2.5.3 Compare decimal fractions and percentages. What have they in common and what is different? [Hint: What is the denominator in each case?] (4)

2.6 Percentages

2.6.1 Calculate; (6)

	a) 60% of 100 = _____ b) 60% of 65 = _____	c) 20 out of 50 = ___% d) 20 out of 500= ___%	e) 3 out of ___= 3% f) 3 out of ___= 15%

a) 60 b) 39 c) 40% d) 4% e) 100 f) 20

2.6.2 Give a real life context for each of b), d) and f) (3)

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Question 3: Patterns

3.1 For this sequence: 8, 13, 18, 23, 28, 33, ...

a) Describe in words the pattern that determines the sequence (2)

b) Continue the sequence for four numbers (2)

c) Give a formula for calculating the 100^{th} number. (4)

3.2 For the geometric patterns below

a) 

b) 

3.2.1 Complete the next two shapes in each pattern (2)

3.2.2 Give a rule for each pattern a) and b) (4)

3.2.2 Explain, using numbers, why we may call a) "rectangular numbers" (1)

3.2.3 Explain in words how these two patterns are related (3)

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Question 4: Measurement

4.1 The formulae for the area and perimeter of a rectangle are given below.

Area of a rectangle: A = l x w Perimeter of a rectangle P = 2 x (l + w)

4.1.1 Explain to a learner what the area of a rectangle is and how to calculate this area. (3)

4.1.2 Explain to a learner what the concept of perimeter is and how to calculate the perimeter of a rectangle. ....." (3)

4.2 Some species of bamboo grow at a rate of 3 cm every 6 hours.

4.2.1 Complete the rate table below:

cm	**1**	**3**	**6**		**9**	
hours		**6**		**24**		**100**

(5)

4.2.2 Explain the rate table above to a Grade 6 child by means of drawings. (4)

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Question 5: Data handling and probability

Measures of central tendency

The maximum temperatures recorded in Johannesburg for the last week of September were: Monday 26°C, Tuesday 25°C, Wednesday 30°C, Thursday 27°C, Friday 29°C, Saturday 23°C, Sunday 22°C.

5.1 Calculate the median temperature. (1)

5.2 Calculate the mean temperature. (1)

5.3 Write instructions on "How to find the median" with a set of odd numbers. (2)

5.4 What is the median of the set, 5, 6, 7, 8, 9, 10? (1)

Probability

5.2 Throwing one die, what are the possible outcomes? (1)

5.3 Throw two dice, one red die and one blue die. What are the possible combinations? Use the table below to record all the combinations (3)

		Red die					
		1	2	3	4	5	6
Blue die	1	1,1	1,2				
	2						
	3						
	4						
	5						
	6	6,1					6,6

5.3 Which sum of combinations is most common? (1)

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Total /100/