

UNIVERSITY OF FORT HARE
Post Graduate Certificate in Education (PGCE)
Mathematics Education MEE511E
2023 Supplementary EXAMINATIONS
June 2023

Time: 3 hours

Marks: 100

This paper consists of 5 pages

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Internal examiner: Dr NCP Ngibe

Instructions

Please read the instructions carefully.

You need to answer all the questions.

Calculators are not allowed.

This paper is divided into two sections, Section A and Section B.

Both Section A and B are compulsory.

Section A

Question 1

Choose and write down the correct letter in each of the following cases:

1. Express $\frac{18}{45}$ in simplest form: (1)

- A. $\frac{5}{2}$
- B. $\frac{2}{5}$
- C. $\frac{3}{15}$
- D. $\frac{6}{5}$

2. One kilometer is the same as _____ meters.

- A. 100
- B. 10000
- C. 10
- D. 1000

3. Which one of the following is not a factor of 15 (1)

- A. 1
- B. 10
- C. 5
- D. 15

4. Arrange the following fractions in ascending order: $\frac{7}{5}; \frac{1}{3}; \frac{5}{7}; \frac{3}{6}$ (1)

- A. $\frac{7}{5}; \frac{5}{7}; \frac{3}{6}; \frac{1}{3}$
- B. $\frac{1}{3}; \frac{7}{5}; \frac{3}{6}; \frac{5}{7}$
- C. $\frac{1}{3}; \frac{3}{6}; \frac{5}{7}; \frac{7}{5}$
- D. $\frac{7}{5}; \frac{3}{6}; \frac{5}{7}; \frac{1}{3}$

(1)

5. Say whether the following statements are true or false. Write T for True and F for False. Give reason for your answer.

A composite number multiplied by a prime number is always an even number. (2)

6. 3 divided by zero is equal to zero. (2)

7. 249 rounded off to the nearest 100 is 300. (2)

[10 marks]

Section B

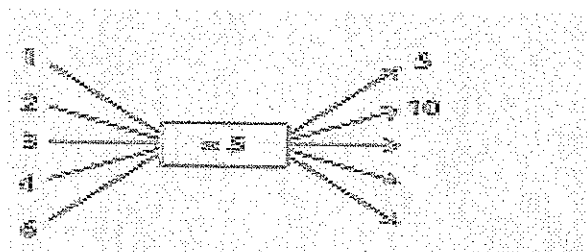
Question 1 Numbers Operations & Relationships

- a) What is the difference between a multiple and a factor? (2)
- b) There are different models that Foundation Phase teachers can use when introducing fractions. Name three fraction models and give examples for each. (6)
- c) Give three addition properties that can be applied when doing addition calculations and provide Foundation phase relevant examples for each. (6)
- d) Foundation Phase mathematics teachers should teach in a way that will help children think mathematically. Kilpatrick proposes five strands of mathematical proficiency that could help mathematics teachers to support mathematical thinking. Discuss five strands of mathematical proficiency and suggest how you could apply their understanding to teach division and multiplication in Foundation Phase. (10)

[24 marks]

Question 2 Patterns, Function and Algebra

- a) Define and provide an example of a growing pattern. (2)
- b) What are important concepts of growing patterns? (3)
- c) Extend (three terms) and describe a rule
 - i) 1, 3, 9, 27, , (2)
 - ii) 13, 9, 5, 1, ... (2)
- d)



(3)

e) What is the purpose of teaching patterns, functions and algebra in Foundation Phase according to the CAPS document. In your own words discuss why this understanding is important for Foundation Phase learners?

(6)

[18 marks]

Question 3 Space and Shape (Geometry)

a) What is the difference between area and perimeter? (2)

b) Define, draw and label the following:

1. Rectangular prism (2)

2. Cube (2)

c) Discuss Van Hiele's levels of Geometric thinking with special focus on the ones applicable to Foundation Phase learners. (6)

d) Van Hiele also described **phases** of learning that support geometric thinking. The phases describe the different kinds of tasks which together make up lessons on space and shape. (6)

[18 marks]

Question 4 Measurement

a) Define capacity. (1)

b) Why is estimation important in Measurement? (1)

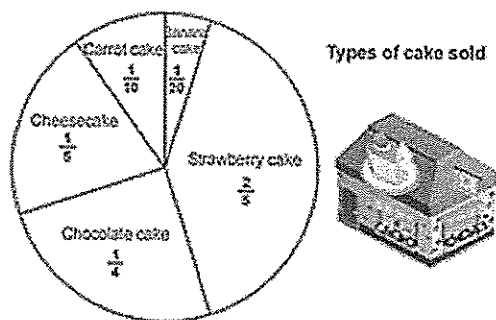
c) Briefly discuss Behaviorism, Cognitivism and Constructivism learning theories and say why it is important for teachers to know these theories. (9)

d) Design a Grade 3 mathematics activity that promotes discovery learning. (4)

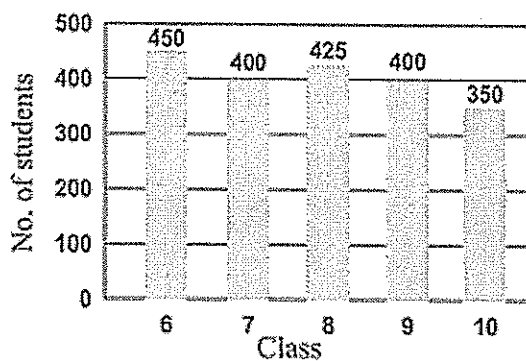
[15 marks]

Question 5 Data Handling

- a) Define data collection process with the aid of data collection cycle (5)
- b) It is the role of the Foundation Phase teacher to ask questions and make assertions when teaching Foundation Phase learners. Provide an example of a relevant question and an assertion for Grade 3 learners. (2)
- c) Look at the graphs below and explain what type of graph it is. (1)



- ii) What fraction of the total are cheesecakes, carrot and chocolate cakes combined? (2)



- iii) Type of graph (1)
- iv) How many more students in class 8 than in class 10? (1)
- d) Why is it important that learners should be able to sort and classify objects before handling data? (3)

[15 marks]

[TOTAL: 100 marks]