



**UNIVERSITY OF JOHANNESBURG**  
**FACULTY OF EDUCATION**  
**DECEMBER**  
**SUPPLEMENTARY EXAMINATION 2015**

**PROGRAMME:** B Ed (FET) and PGCE  
**MODULE:** TEACHING METHODOLOGY & PRACTICUM: FET  
MATHEMATICS  
SUBJECT METHODOLOGY: MATHEMATICS  
SUBJECT METHODOLOGY: MATHEMATICS (PGCE)  
**CODE:** MPFMAY1  
XWI0000  
XWI0001  
**TIME:** 3 hours  
**MARKS:** 150  
**EXAMINER:** MRS KIM RAMATLAPANA  
**MODERATOR:** MRS LECRETIA REDELINGHUYS (NWU-VAAL)  
(This paper consists of **5** pages)

**INSTRUCTIONS**

Read the following instructions carefully before answering the questions:

1. This question paper consists of **10** questions.
2. Answer **ALL** the questions.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Write legibly and present your work neatly.
5. Read the questions carefully before answering them.
6. Questions are to be answered in English.

**QUESTION 1**

- 1.1. Explain the roles of a Mathematics teacher in an Integrated Quality Management System (IQMS). (10)
- 1.2. Describe the Guided Reflection protocol (Hole and McEntee, 1999). (10)
- (20)**

**QUESTION 2**

Explain what a personal growth plan (PGP) is, and also briefly discuss what aspects of growth it addresses.

**(8)**

**QUESTION 3**

You are planning to teach properties of quadrilaterals.

Discuss the six (6) questions that will guide you in planning for this lesson. **(18)**

**QUESTION 4**

Shulman (1986, p.14) noted that “those who can, do. Those who understand, teach”. Therefore, teachers must not only be capable of defining for learners something, they must also be able to understand and explain why it should be done (Shulman, 1986, p. 9).

Discuss the following categories of teacher knowledge according to Shulman (1986):

- 4.1. Subject matter knowledge (SMK) (3)
- 4.2. Curricular knowledge (CK) (3)
- 4.3. Pedagogical content knowledge (PCK). (3)
- (9)**

**QUESTION 5**

- 5.1. Mathematics is one of many subjects in the school curriculum. Explain the rationale for the inclusion of Mathematics in the school curriculum. (6)
- 5.2. Explain the relationship between curriculum and instruction in the dualistic model. (6)

- 5.3. Mathematics learners, who have difficulty translating a concept from one representation to another, will have difficulty solving problems in different contexts. Discuss the role of representations as a cognitive process of 'doing' Mathematics. (6)

**(18)**

### **QUESTION 6**

The development of creative thinking in Mathematics acknowledges that the development of creativity is dependent on the individual's aptitude, potential and education. The creative act in Mathematics can be seen as certain phases, but the transition from one phase to another is not strictly demarcated.

Discuss the four phases of a creative act in Mathematics listed below:

- 6.1. Preparation (4)  
6.2. Incubation (4)  
6.3. Illumination (4)  
6.4. Verification. (4)

**(16)**

### **QUESTION 7**

Discuss the ways in which knowledge can be obtained regarding the Mathematics learner. (6)

### **QUESTION 8**

- 8.1 What is assessment? (3)  
8.2 Discuss Polya's four (4) steps in problem-solving (6)  
**(9)**

**QUESTION 9**

- 9.1. Discuss the different types of questions in a Mathematics question paper. Give examples for each type. (18)
- 9.2. Use the Bloom's revised taxonomy to classify the following questions. Give reasons for your answers. (12)

**9.2.1.**

Change the subject of the formula  $A = \pi (R^2 - r^2)$  to  $r$ . (2)

**9.2.2**

The perimeter of a rectangle is 80 cm and the length is  $x$  cm. (2)

Determine the area.

**9.2.3.**

The length of a rectangle is 3 m longer than the breadth. If the length is increased by 3 m and the breadth is decreased by 2 m, the area remains unaltered.

Calculate the breadth of the rectangle. (2)

**9.2.4.**

A circular dam has a circumference of 308 m. Determine the area if

$\pi = 22 / 7$  (2)

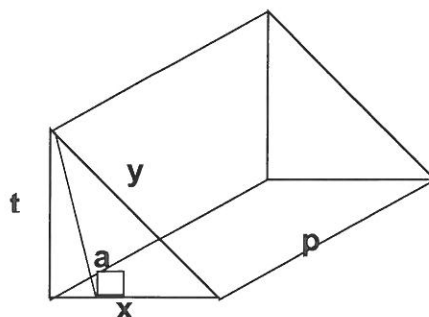
**9.2.5.**

Calculate the surface area of a cylinder with radius 7 cm and height 8 cm if

$\pi = 22 / 7$ . (2)

**9.2.6.**

Determine a formula for the surface area of the triangular prism. (2)

**(30)**

**QUESTION 10**

- 10.1. Differentiate between recording and reporting. Give examples of what a Mathematics teacher record and report. (6)
- 10.2. Give examples of baseline, informal, diagnostic, formal and systemic assessment in Mathematics (10)
- (16)**

**TOTAL: 150**

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