BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

JUN 2023

SCIENCE AND MATHEMATICS EDUCATION DEPARTMENT

DIPLOMA IN SCIENCE EDUCATION

MT007: Applied Mathematics Education 11

DURATION: 3 HOURS

INSTRUCTIONS

1. Answer all questions in Section A and any two questions from Section B
2. Each question should begin on a new page

SECTION A: (compulsory question)

A1. The teaching and learning of various mathematics topics at secondary school level have experienced many challenges such as: inadequate treatment of content, lack of deep engagement with concepts, drill and practice for examination purposes.

Such topics include:

- Geometric transformation
- Vectors
- Matrices
- Geometric constructions (locus)
- Linear programming
- Quadratic equations

Choose one topic and discuss it under the following headings;

a) Brief historical development pointing out the main proponents in the area. [10]
b) Explanation (s) of major concepts involved giving appropriate examples. [20]
c) Detailed Lesson Plan (DPL) on how to teach one of the concepts. [10]

SECTION B (40MARKS)

2. (a) Solve the equation $2x^2 + 6x + 1 = 0$, giving the answer to 2 decimal places.[5]

(b) Use ruler and compasses only for all constructions and show all constructions arcs. Construct on a single diagram:

(i) Quadrilateral $ABCD$ in which $AB = 10cm,\ AD = 6cm, BC = 13cm$; angle $ABC = 30$ and angle $DAB = 120$ [3]

(ii) the locus points that are $5cm$ from A. [2]

(iii) the locus points that are equidistant from AB and AD [2]

(iv) the locus of points $3cm$from A [2]

(v) Explain any three purposes of assessing students in mathematics education [6]

3. Teacher's deep understanding of subject matter taught is crucial for effective teaching. Discuss. [20]

4. Justify the need of a marking guide in mathematics education. [20]

5. Identify five aspects included in a lesson evaluation and justify why each aspect is important.

[20]

END OF EXAMINATION PAPER