



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

CIVIL ENGINEERING

**SUBJECT: Surveying for Civil Engineering
Works**

PAPER NO: 578/23/M05

DURATION: 3 Hours

MAY/ JUNE 2025 EXAMINATION

REQUIREMENTS

Scientific Calculator

INSTRUCTIONS TO CANDIDATE

1. Answer all questions.
2. All questions carry equal marks.
3. Do not write anything on the question paper.
4. Do not tear any page from Answer Booklet.
5. Do not write your name anywhere.

This paper consists of 3 printed pages.

QUESTION 1

- a) Briefly describe the following methods used in volume calculations.
- i) Cross section (5 marks)
 - ii) Spot heights (5 marks)
 - iii) Contours (5 marks)
- b) Write short notes on the Mass haul diagram including diagrams. (10 marks)

QUESTION 2

- a) Discuss how the positioning of reference bench marks and targets in deformation surveys of large building in the city centers and in case of concrete arch dam walls. (10 marks)
- b) Write short notes on the following including diagrams where possible :
- i) Intersection (5 marks)
 - ii) Resection (5 marks)
 - iii) Vertical movement (5 marks)

QUESTION 3

Adjust the following angles from the centred during a triangulation exercise. Use equal shift method in your adjustments:

Angle	Observed value
1	26.10.48
2	27.37.16
3	35.46.10
4	32.57.52
5	28.23.12
6	29.04.37
7	126.11.59
8	111.15.52
9	122.32.04

(25 marks)

QUESTION 4

- a) Briefly describe what a curve ranging is, giving an example. (10 marks)
- b) Write short notes on the three (3) main headings of curves.
- i) Circular (5 marks)
 - ii) Transition curves (5 marks)
 - iii) Vertical curves (5 marks)

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