



**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

PROGRAMME: BSC AGRIC II (LWM)

COURSE CODE: LUM 204 (NEW PROGRAMME)

TITLE OF PAPER: LAND SURVEYING

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER
QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION I: COMPULSARY

QUESTION ONE

- A) Figure 1 on the following page was drawn at a scale of 1:1000 in November, 2000 using chain surveying data of Viewfield Industrial Estate in Dumbarton, England surveyed by Mr. D.W. Pemberton on 23rd April, 1993.
- i. Complete the plan or map shown in Figure 1 by including the title block and all the necessary information that a surveying plan or map should have. [11 marks]
 - iii. Why should chain lines be excluded in such maps? [4 marks]
 - iv. Compute the area of the factory using any method known to you. [6 marks]
- B)
- i. Define “off-sett” as used in chain surveying. [3 marks]
 - ii. What are the other two methods of off-sett measurements used in surveying other than the tape measure? [6 marks]
 - iii. Describe with the aid of a sketch how the tape measure is used to measure offsets during chain surveying? [10 marks]

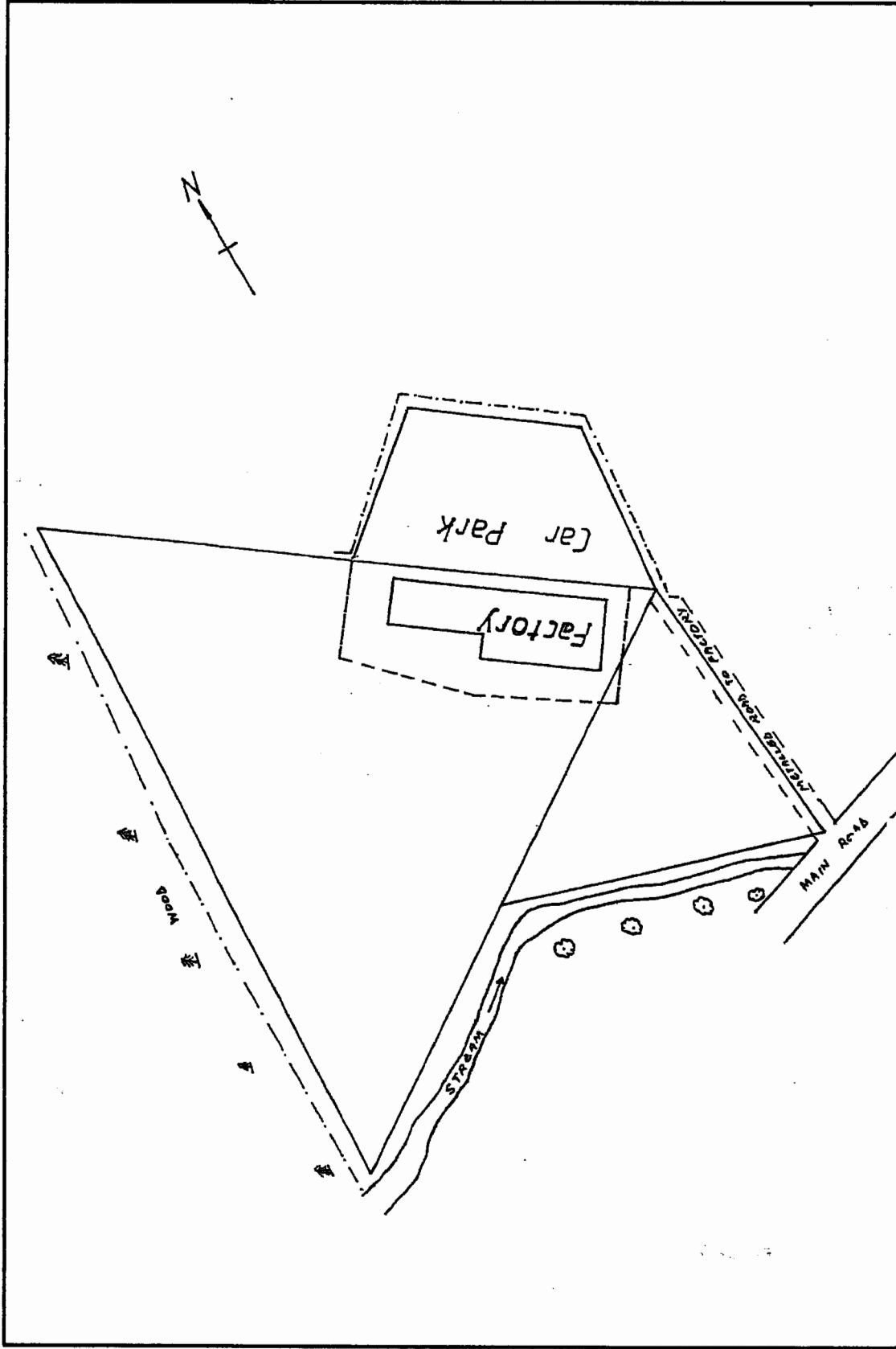
SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO

- A) State the instruments or techniques that are used in direct distance measurements as well as in optical distance measurements. [5 marks]
- B) Describe with the aid of a sketch how the electromagnetic distance measurement (EDM) instruments operate. [14 marks]
- C)
- i. Name any three (3) methods of linear measurements used in surveying. [3 marks]
 - ii. A surveyor measured the length of a dam flood spillway using a dumpy level. During measurement the upper stadia reading was recorded in the field book as 3.850 m, while the lower one was 1.450 m. Calculate the flood spillway length. [6 marks]
 - iii. Which method of linear measurement could have been used to estimate the length of spillway, if the surveyor new his/her pace factor, but there was no dumpy level available? [2 marks]

Examination NO:.....

Figure 1. Chain Surveying Map



QUESTION THREE

- A) What are the three methods that can be used for slope measurement? [3 marks]
- B) A land use planner was given a contour map or plan showing an area proposed for use as a botanical garden by the Mankayane Town Board. The map was drawn on a scale of 1:1000. The land use planner was asked to determine the general slope of the area in order to facilitate decision making an planning. While doing this, she discovered that one of the major slope breaks occurred between contour lines 29.0 m and 34.0 m, whose distance was 10 cm apart.
- i. Calculate the percentage slope for this slope break. [7 marks]
 - ii. In your opinion state if this slope would be suitable for the establishment of a botanical garden and give your reason why it is suitable. [5 marks]
- C) During the setting-out of a botanical garden, the site in question had to be levelled. To do this a topographic survey of 30 m x 30 m was conducted in an attempt to provide the required contour map from which a formation depth of 1.5 m was determined. The sum of N (the number of times the reduced level has been used) was computed as 40.0, while the total height of the reduced level multiplied by N was 4840.0 m.
- i. Calculate the mean height. [5 marks]
 - ii. Calculate the depth of excavation. [5 marks]
 - iii. Determine the volume of excavation. [5 marks]

QUESTION FOUR

- A) What are the three types of a surveyor's level? [6 marks]
- B) Name the two methods that are used for booking levelling data. [4 marks]
- C) Book the levelling data shown in Figure 2 using Table 1 and carryout the necessary arithmetic checks. [20 marks]

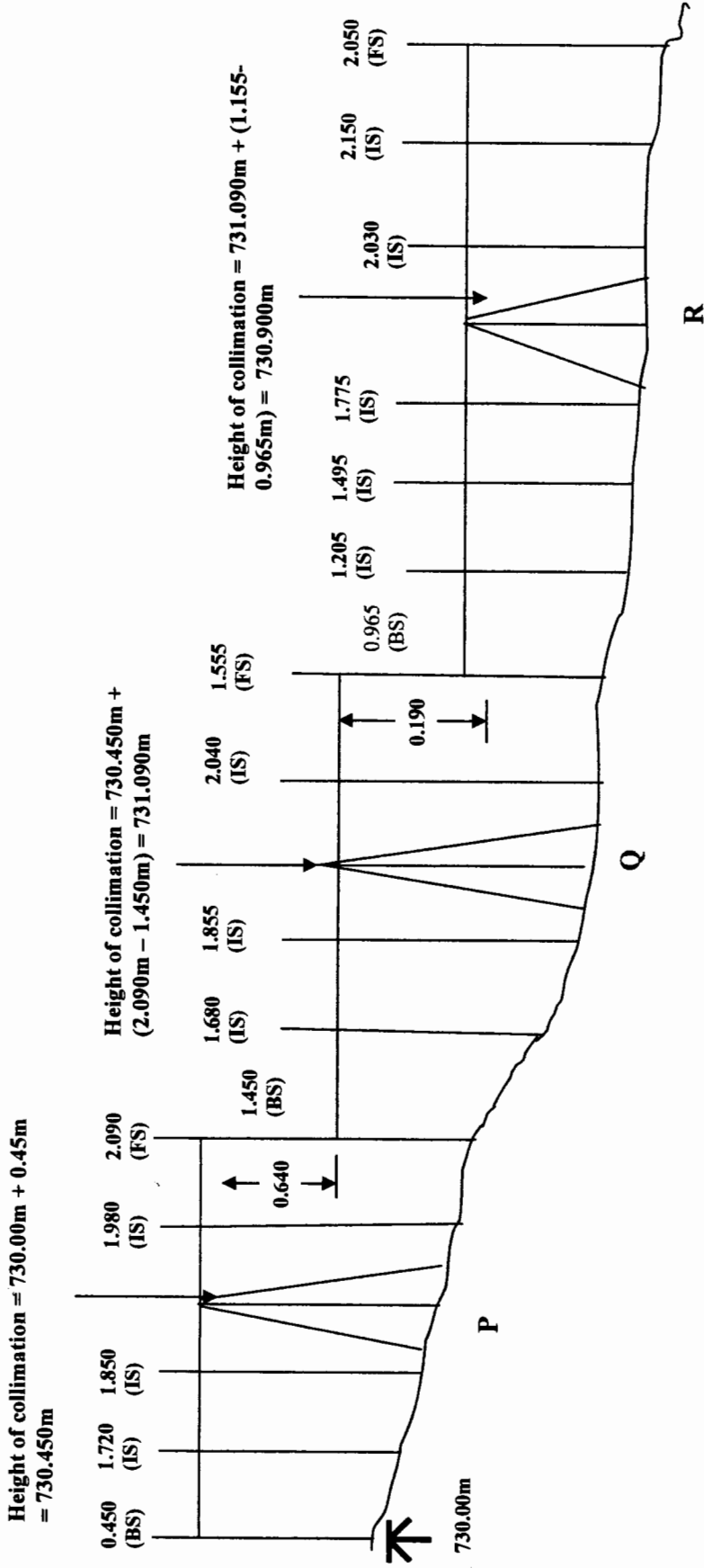


Figure 2. Road section between Cardiff Hall and the Education Centre, UNISWA, Luyengo Swaziland.

