



**UNIVERSITY OF SWAZILAND
FACULTY OF AGRICULTURE**

SUPPLEMENTARY EXAMINATION: JULY 2006

DIPLOMA IN AGRICULTURE 11 AND DIPLOMA IN AGRICULTURAL EDUCATION II

LUM 202: LAND SURVEYING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTIONS ONE AND ANY OTHER TWO QUESTIONS

SPECIAL MATERIAL REQUIRED: NONE

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SECTION ONE: COMPULSORY

QUESTION ONE

(a) Fig 1 below shows the leveling of a farm road. Book the leveling data using the rise and fall method and carry out all the arithmetic checks. Point D is a change point. (30 marks)

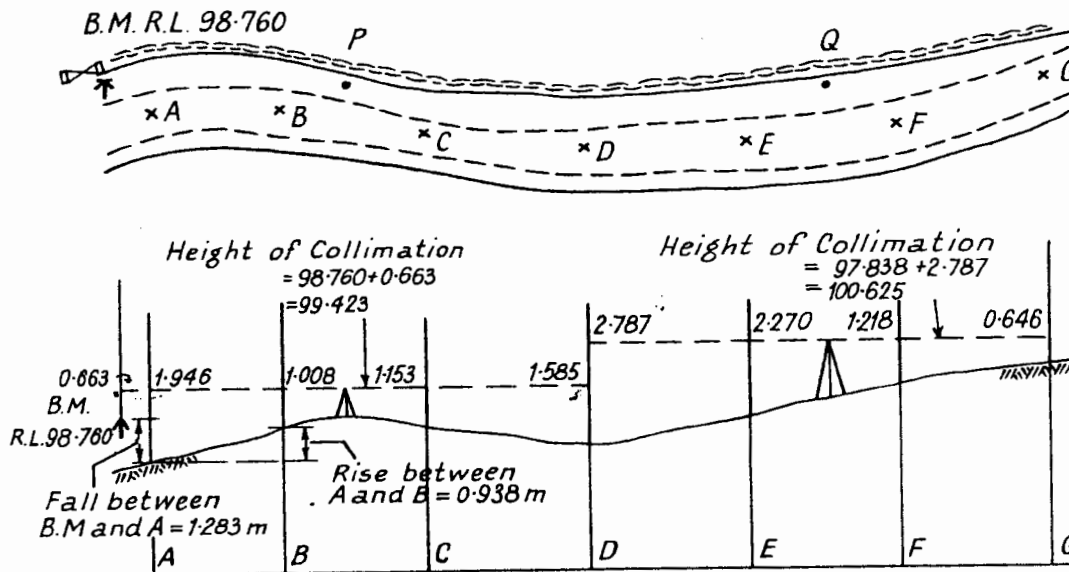


Fig 1: Leveling data for a farm road

(b) A bicycle wheel odometer or measuring wheel was used to measure the perimeter of a maize field and it recorded 725.5 revolutions. During calibrations, a known distance of 67.50m was used and the odometer registered 125.0 revolutions. Calculate the perimeter of the field in meters (10 marks)

SECTION TWO: ANSWER ANY TWO QUESTIONS

QUESTION TWO

A railway cutting has a formation width of 10m and the side slopes are 1 vertical to 5 horizontal. The ground surface is everywhere horizontal. The depths of the cutting at the centre line are given by table 1.

Table 1; Depth of cut along a rail line

| Distance (m) | 0 | 50 | 100 | 150 | 200 | 250 | 300 |
|--------------|------|------|-----|-----|-----|-----|------|
| Depth (m) | 6.64 | 6.64 | 7.2 | 8.6 | 8.4 | 9.2 | 10.4 |

Compute the volume of the excavation in m³ over this length of cutting using the Trapezoidal formula. (30 marks)

QUESTION THREE

(a) Table 2 shows the measurements made from a chain line to an irregular boundary. Calculate the area between the chain and the boundary using Simpson's rule. **(20 marks)**

Table 2: Records of offsets measurements

| | | | | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Chainage(m) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| Offsets(m) | 5.5 | 6.4 | 7.3 | 7.9 | 8.2 | 6.7 | 4.9 | 3.0 | 0 |

(b) The distance between two points was measured with a tape the nominal length of which was known to be 20.00m. It was however discovered that the correct length of the tape was 20.08m. If the calculated length was 462.2m, what is the actual distance between the two points? **(10 marks)**

QUESTION FOUR

(a) A Field or Extension Officer was asked by a farmer to determine the size of his field in an attempt to eventually compute the quantities of inputs for his field. Unfortunately, neither the officer nor the farmer had any measuring equipment other than the Officer's known pace factor of 0.60m.

i) What method of measurement was the Extension Officer supposed to use **(5 marks)**

ii) State any two (2) limitations of this method **(5 marks)**

iii) If the recorded paces of the four (4) sides of the field were as shown in the table below. Compute the area of the field. **(20 marks)**

Table 3: Field measurement data

| | | | | |
|--------------|-----|----|----|----|
| Field side | AB | BC | CD | DA |
| Length(pace) | 100 | 40 | 87 | 45 |