UNIVERSITY OF ESWATINI

FINAL EXAMINATION PAPER

PROGRAMME: BSC ABE II

COURSE CODE: ABE207

TITLE OF PAPER: LAND SURVEYING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS.

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SECTION I: COMPULSORY

QUESTION ONE

A)   Describe the difference between a **level line** and a **horizontal line** with the **aid** of a diagram.   **(8 marks)**

B)   Differentiate between plane surveying and geodetic surveying with particular reference to a level line and horizontal line.   **(5 marks)**

C)   Levelling as a surveying technique is affected by the Earth's curvature and Atmospheric Refraction. Briefly describe how levelling is affected by these two entities.   **(12 marks)**

D)   A levelling staff was held at a distance of 200 m away from a surveyor's level and a reading of **2.758 m** was obtained.

   i.   Compute the correction due to **curvature and refraction**, empirically. **(5 marks)**

   ii.   Use a diagram or sketch to reflect the correction.   **(5 marks)**

   iii. Calculate the **corrected** reading due to the **combined effect**.   **(5 marks)**

                                                                     [40 marks]

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO

A)   Briefly discuss the role of signals and symbols in surveying.   **(5 marks)**

B)   State the meaning of the signals and symbols shown in **Figure 1** as used in land surveying.   **(20 marks)**

C)   Briefly describe the land surveying process stating the three stages involved.   **(5 marks)**

                                                                        [30 marks]

QUESTION THREE

A)   What are the **three (3)** types of a surveyor's level?   **(6 marks)**

B)   Name the two methods that are used for booking levelling data.   **(4 marks)**

C)   The levelling data shown in **Figure 2** was conducted by Mr Vusi Msimango on a partly cloudy day as part of his assignment for the course **ABE 204: Land Surveying**, in August, 2012. Book the data using the rise and fall method on Table 1 and carryout the necessary arithmetic checks.   **(20 marks)**

                                                                        [30 marks]

EXAMINATION NUMBER: ....
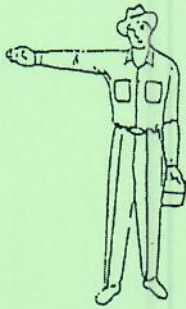
i. ....

ii. ....
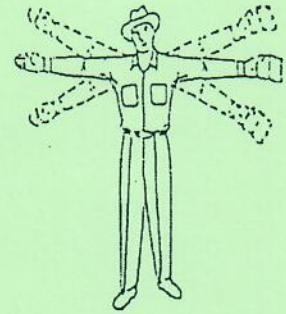
iii. ....

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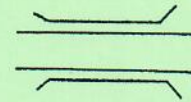
ix. ....

x. ....

Figure 1. Common surveying signals and symbols.

Height of collimation = 730.00m + 0.45m
= 730.450m

Height of collimation = 730.450m −
0.640 m) = 729.810 m

Height of collimation = 729.810 m −0.965 m =
728.845 m

0.450 (BS)   1.720 (IS)   1.850 (IS)   1.980 (IS)   2.090 (FS)

0.640

1.450 (BS)   1.680 (IS)   1.855 (IS)   2.040 (IS)   1.555 (FS)

0.190

0.965 (BS)   1.205 (IS)   1.495 (IS)   1.775 (IS)   2.030 (IS)   2.150 (IS)   2.050 (FS)

730.00m

P

Q

R
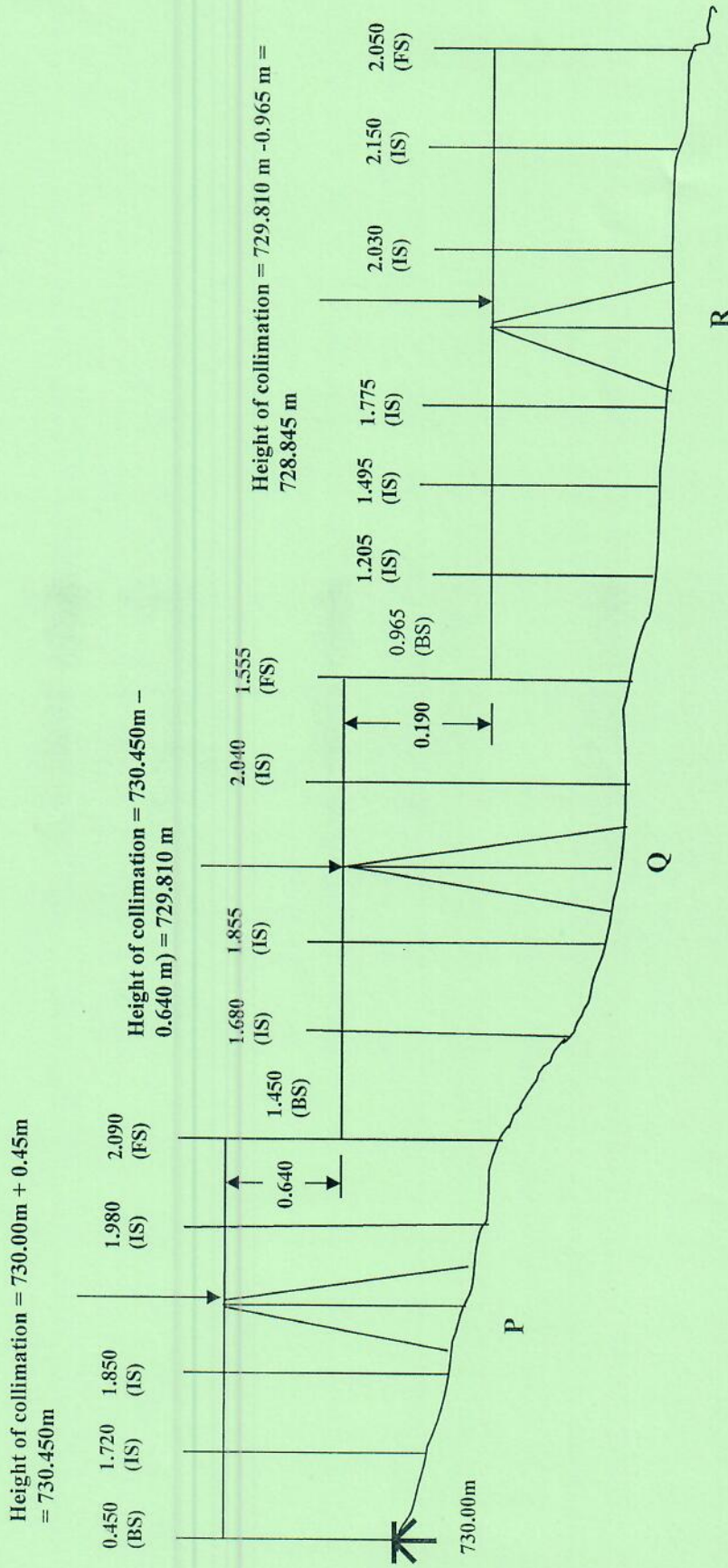
Figure 2. Road section between Cardiff Hall and the Education Centre, UNESWA, Luyengo.

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Examination N0.:...

Table 1: ....

Surveyor: .... Name and Location of Site: ....

....

....

Date:......................... Instrument Type & N0.:...................................

Weather: ....

Back Sight	Intermediate Sight	Fore Sight	Rise	Fall	Reduced Level	Distance (m)	Remarks

QUESTION FOUR

A)   Name any **three (3)** methods of computing areas from maps other than the Simpson's and Trapezoidal's Rules.   **(6 marks)**

B)   i.   Define **offset** as used in chain surveying.   **(2 marks)**

     ii.   What are the **three (3)** methods of measuring offsets?   **(6 marks)**

C)   The chain surveying data on Table 2 were recorded in the field when chaining and measuring **off-sets** of a proposed road or track from a near-by embankment. Compute the area between the road and the embankment using both Simpson's and Trapezoidal rules.   **(16 marks)**

Table 2. Embankment chaining field measurements.

Station	A	B	C	D	E	F	G	H	I	J	K	L
Chainage (m)	0	15	30	45	60	75	90	105	120	135	150	165
Offset (m)	6.3	4.2	3.8	2.1	8.2	9.3	6.7	4.6	3.2	1.2	0.2	1.0

[30 marks]