

UNIVERSITY OF ESWATINI

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

FINAL EXAMINATION, DECEMBER 2019

B.A., B.Sc., BASS, B.Ed.

TITLE OF PAPER: ELEMENTARY SURVEYING & CARTOGRAPHY

COURSE NUMBER: GEP211

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS: 1. ANSWER THREE QUESTIONS

- 1. QUESTION 1 IS COMPULSORY**
- 2. ILLUSTRATE YOUR ANSWERS WITH EXAMPLES AND CLEARLY DRAWN DIAGRAMS WHERE APPROPRIATE**

**ALLOCATION OF MARKS: QUESTION 1 (COMPULSORY) CARRIES 40
MARKS, WHILE THE REST CARRY 30
MARKS EACH**

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS GRANTED BY THE
INVIGILATOR**

GEP211: ELEMENTARY SURVEYING & CARTOGRAPHY - DECEMBER 2019

SECTION A: COMPULSORY

Question 1

Figure 1 shows data that was collected from the field during a levelling process.

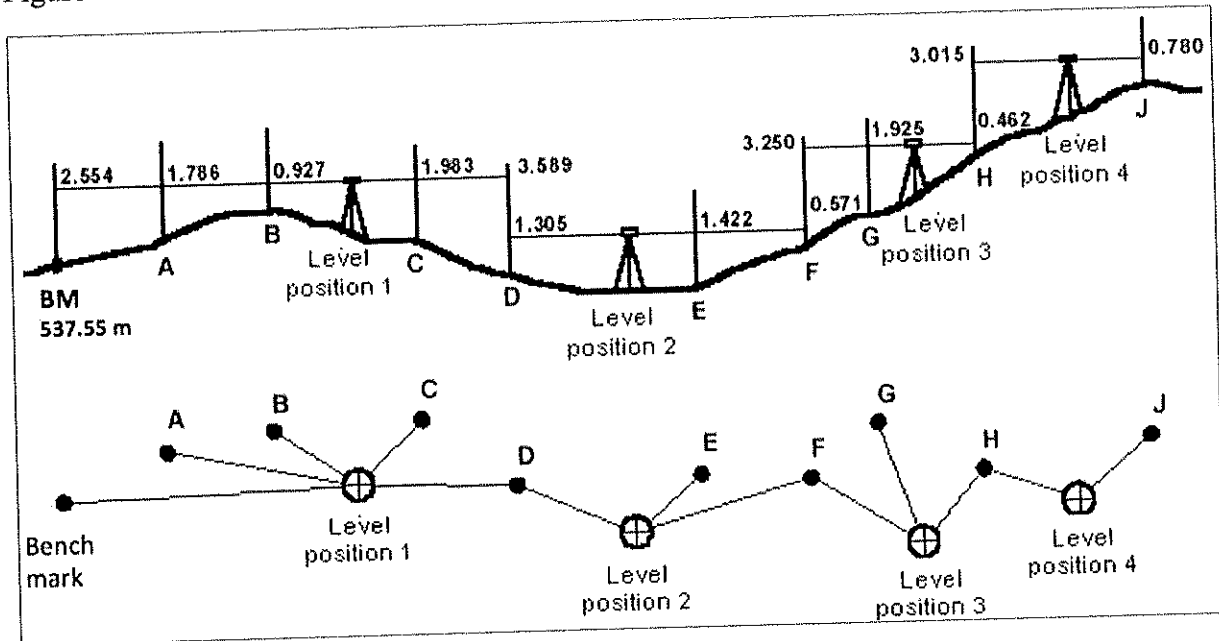


Figure 1: Field levelling data for a site

- a) Use the TWO (2) booking methods used in surveying to undertake levelling for this site. Blank levelling field tables are appended to this question paper for your use. (24 marks)
- b) On both methods, clearly show how you have carried out the necessary arithmetic checks to ensure that the booking was accurate. (6 marks)
- c) Given that the distance between station E and station J was 500 metres, calculate the angle of the slope E-J, and give your answer in both degrees and in percentage. (10 marks)

(10 marks)

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

Question 2

- a) Define map projection. (2 marks)
- b) Globes are said to portray the ideal nature of the Earth. Discuss the inherent problems of globes that justify the wide use of map projections to produce conventional maps. (20 marks)
- c) Outline the conditions that an ideal distortion-free map must satisfy. (8 marks)

(30 Marks)

Question 3

Describe in detail, any three direct linear measurement methods used in surveying, and highlight the advantages and disadvantages of each method.

(30 Marks)

Question 4

- a) Figure 2 shows a cartographic map manipulation technique.

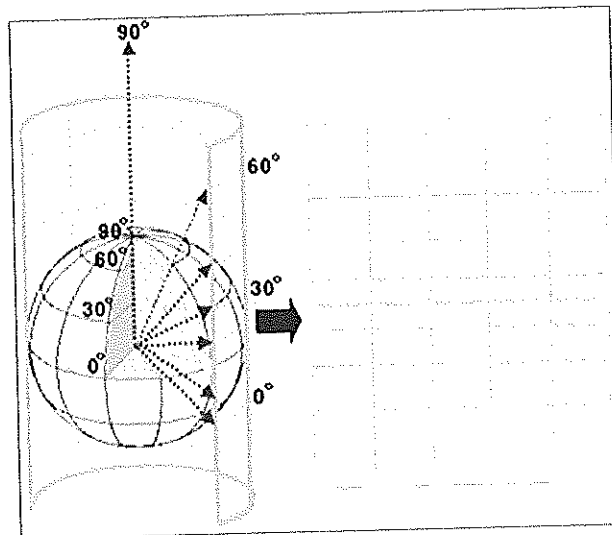


Figure 2: Globe and grid map

- i) Name the cartographic technique illustrated in the Figure 2. (2 marks)
- ii) State the three categories of this cartographic technique. (3 marks)

iii) Briefly describe the significance of this technique in modern geography. (5 marks)

- b) A surveyor used a clinometer to measure the height of a building. Given that the eye level height of the surveyor was 1.7 metres, and that the surveyor was standing 10 metres away from the building with the string-weight line (Figure 3) reading 105° on a normal protractor ($0 - 108^{\circ}$), calculate the height of the building. (10 marks)

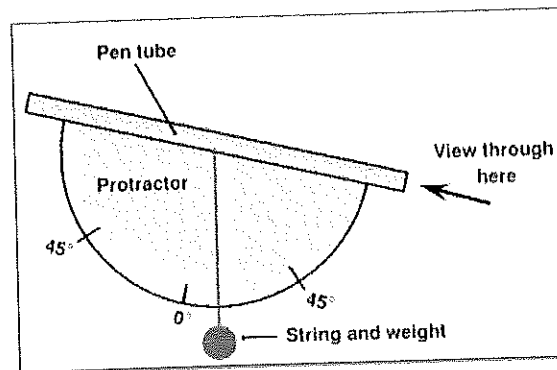


Figure 3: Clinometer reading

- c) Discuss the general cartographic rules used for positioning lettering for the following; (5 marks)
- Areal features (5 marks)
 - Linear features

(30 Marks)

Question 5

- a) Define the following terms associated with levelling; (10 marks)
- Ordinance datum
 - Local attraction
 - Intermediate sight
 - Traversing
 - Reduced level
- b) Describe the stages involved in the surveying process. (10 marks)
- c) Describe the principal divisions or classifications of surveying, and highlight how they differ from each other. (10 marks)

(30 Marks)

