



TECHNICAL UNIVERSITY OF MOMBASA

**FACULTY OF ENGINEERING AND TECHNOLOGY IN CONJUNCTION WITH KENYA
INSTITUTE OF HIGHWAYS AND BUILDING TECHNOLOGY (KIHBT)**

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR:

HIGHER DIPLOMA IN BUILDING ECONOMICS

EBE 3107: SITE SURVEYING AND SETTING OUT I A

END OF SEMESTER EXAMINATIONS
SERIES: OCTOBER 2016

TIME: 2 HOURS

Instruction to candidates

You should have the following for this examination

- Answer booklet
- Pocket Calculator

This paper consist of five question.

Answer any three questions of the five questions

All question carry equal marks

Maximum marks for each part of a question are as shown

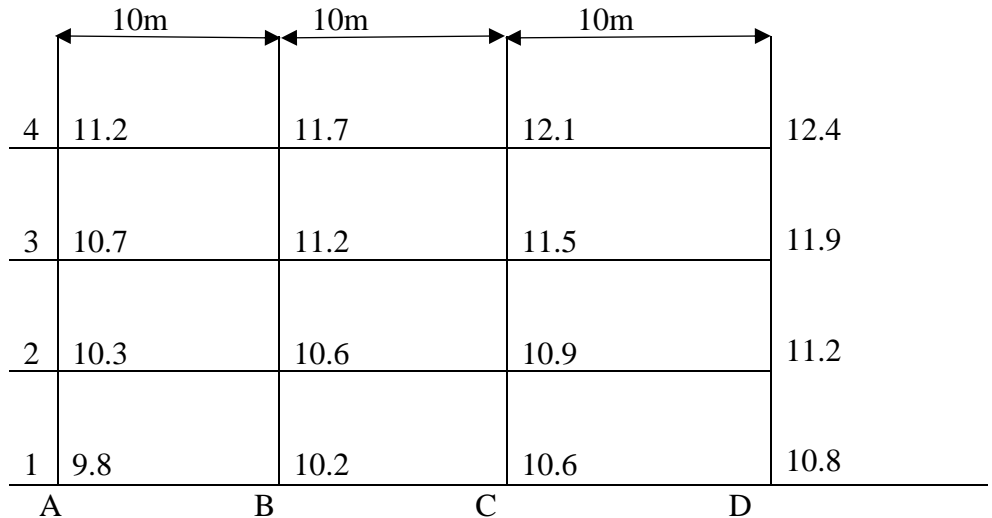
This paper consist of two printed pages

Question one

- a) Define the following terms as used in chain surveying:
- i) Chainage
 - ii) Offset
 - iii) Survey line
 - iv) Survey station
 - v) Base line
 - vi) Trilateration
- (6marks)**
- b) A line was measured with steel band measure believed to be 30.00m and found to be 258.075m. However, on a re-examination of the steel band it was found to measure only 29.750m long.
- i) Calculate the correct length of the line
 - ii) If the steel band above (b) (i) was used to measure an area and found to be 6.89 hectares. Calculate the correct area.
- (4marks)**
- c) With the aid of a sketch, explain the measurement procedure of a line longer than a tape length.
- (10marks)**

Question two

- a) State any **FIVE** characteristics of a contours **(5marks)**
- b) State any **FOUR** uses of contours maps **(4marks)**
- c) Figure 1 shows the heights of the intersection of a rectangular grid for plot
 - i) Draw by estimation the 10.0, 10.5, 11.0, 11.5 and 12.0 contours. **(11marks)**
 - ii) Calculate the position of 11.00 contour between grid intersection C2 and D2.



Question three

a) Define the following terms

- i) Back sight
- ii) Foresight
- iii) Change point
- iv) Bench marks
- v) Level line

(6marks)

b) Describe the procedure of levelling a dumpy level

(6marks)

c) With the aid of a sketch, describe the construction of a dumpy level (8marks)

Question four

A trench AB is to be excavated for a pipe line which is to have a downward gradient from A to B of 1 in 100. A levelling instrument has been used to determine ground levels at points along the French, and staff readings are shown in the following table 1.

- a) Complete the rise and fall columns and reduce the levels
- b) Carry out the usual arithmetical checks
- c) Determine the depth of the trench at 20m point along the trench if the depth of the trench at A is 0.8m below the surface of the ground. (20 marks)

BS	IS	FS	Distance (m)	Remarks
1.50			0	30.000 Point A
	1.60		20	Peg 1
	1.60		40	Peg 2
	2.10		60	Peg 3
	1.80		80	Peg 4
		2.30	100	Point B

Question five

- a) A cutting has a formation width of 10m and the side slopes are 1:1. The ground surface is horizontal. Find the volume of the excavation between two cross-sections 100m apart. Vertical depths at the end cross-sections are 3m and 5m, respectively.

(10 marks)

- b) Define the following terms as used in mass haul diagram

- i) Haul distance
- ii) Free haul distance
- iii) Waste
- iv) Borrow

(6marks)

State four properties of mass haul curve

(4marks)