# FACULTY OF ENGINEERING AND TECHNOLOGY IN CONJUCTION WITH KENYA INSTITUTE OF HIGHWAYS AND BUILIDNG TECHNOLOGY (KIHBT) 

# DEPARTMENT OF BUILDING AND CIVIL ENGINEERING UNIVERSITY EXAMINATION FOR: <br> HIGHER DIPLOMA IN BUILDING ECONOMICS <br> EBE 3107: SITE SURVEYING AND SETTING OUT I A <br> END OF SEMESTER EXAMINATIONS <br> SERIES: OCTOBER 2016 

TIME: 2HOURS

## 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
b) A line was measured with steel band measure believed to be 30.00 m and found to be 258.075 m . However, on a re-examination of the steel band it was found to measure only 29.750 m 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
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 $A B$ 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 20 m point along the trench if the depth of the trench at A is 0.8 m 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 10 m and the side slopes are $1: 1$. The ground surface is horizontal. Find the volume of the excavation between two cross-sections 100 m apart.
Vertical depths at the end cross-sections are 3 m and 5 m , 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

State four properties of mass haul curve

