



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBE 3105: SITE SURVEY & SEETING OUT I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: FEBRUARY/MARCH 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Mathematical Tables*
- *Scientific Calculator*

This paper consists of **FIVE** questions

Answer question **ONE (COMPULSORY)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question 1

a) (i) Differentiate between the following types of errors in chain surveying giving two examples of each:

- (i) Cumulative errors
- (ii) Cross errors

(ii) Show that correction for slope in linear measurement is given by:

$$l = \frac{h^2}{2L}$$

l

Where: = correction for slope

h = difference in height between measuring heads

L = Measured line

(10 marks)

b) Describe the following temporary adjustment of a dumpy level:

- (i) Setting up and leveling
- (ii) Adjustment for parallex

(10 marks)

SECTION B (Answer any TWO questions from this section)

Question 2

a) Show that the correction for curvature in leveling is given by: $C = 0.078K^2$

Where:

- C = Correction for curvature in metres
- K = length given of sight in kilometers

(5 marks)

b) The information shown in table 1 is for a leveling exercise along a length of proposed road 200.00m long. Calculate the following:

- (i) The reduced levels of the points by the rise and fall method applying the necessary arithmetical checks.
- (ii) The gradient of the road between points A and K given that the road is to run at uniform gradient between these grounds points.

(15 marks)

Table 1

| BS | IS | FS | Distance | Remarks |
|-------|-------|-------|----------|-----------------|
| 2.548 | | | | TBM RL = 100.57 |
| | 2.345 | | 0.00 | Point A |
| | 2.491 | | | B |
| | 2.590 | | | C |
| 1.278 | | 3.780 | | D |
| | 1.782 | | | E |
| | 1.994 | | | F |

| | | | | |
|-------|-------|-------|--|---|
| | 1.580 | | | G |
| 1.011 | | 2.010 | | H |
| | 1.257 | | | I |
| | 1.333 | | | J |
| | | 0.987 | | K |

Question 3

- a) State the precautions necessary to minimize the following errors due to natural cause in leveling.
- Wind
 - Sun
 - Refraction and curvature
- (6 marks)
- b) (i) State any **THREE** factors that dictate the vertical interval in contouring
(ii) With the aid of sketch, describe the grid method of contouring
- (14 marks)

Question 4

- a) (i) State any uses of mass haul diagrams
(ii) State any **FOUR** properties of mass haul diagrams
- (10 marks)
- b) Explain the procedure used to run a longitudinal section
- (10 marks)

Question 5

- a) (i) Distinguish cross-sections from longitudinal sections
(ii) With the aid of suitable examples, illustrate the level book form method used for running cross-section
- (10 marks)
- b) The area surrounding Nautical block is to be surveyed. Describe the grid method of contouring that can be applied
- (10 marks)