



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

DCC 09, DBC 09, CA 09

SEMESTER EXAMINATIONS

APRIL/MAY 2010 SERIES

ENGINEERING SURVEY I

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination:

- Answer booklet
- Writing materials
- Calculator

This paper consists of **FIVE** Questions.

Question **ONE** is compulsory.

Answer any other **TWO** questions.

The maximum marks to each part of a question are all shown.

Question ONE

- (a). Define the following terms as used in surveying:
- (i). Offset
 - (ii). Base line
 - (iii). Horizontal line
 - (iv). Reduced level
 - (v). Survey station
 - (vi). Horizontal equivalent in contouring
 - (vii). Contour gradient
- (7 Marks)**
- (b). Briefly describe **THREE** equipment used in marking while carrying out chain survey. **(3 Marks)**
- (c). In order to plot a longitudinal section of a proposed road, the following staff readings were taken at regular intervals along the centre line of the proposed road:
0.80, 0.97, 1.21, 2.05, 2.31, 1.25, 1.87, 2.66, 0.72, 1.66, 1.59, 2.21, 2.65 and 3.00. The staff was changed at the 2nd, 5th, 9th and 11th readings.
Reduce the levels by rise and fall method sharing all arithmetic checks. **(20 Marks)**

Question TWO

- (a). Briefly describe **TWO** methods of taking measurements on a sloping ground while carrying out chain survey. **(6 Marks)**
- (b). With aid of a sketch describe the operation of a dumpy level. **(10 Marks)**
- (c). Explain how temporary adjustment of a tilting level is achieved. **(4 Marks)**

Question THREE

- (a). After completing a survey, a 30.00 Meter band was checked and found to be 30.023m long.
What is the true length of AB observed to be 125.510m long? **(5 Marks)**
- (b). With the aid of sketch describe a method of ranging a line over a small hill chain survey. **(5 Marks)**
- (c). Describe **FOUR** characteristics of contours. **(4 Marks)**
- (d). Briefly outline **SIX** reading and booking errors in chain survey. **(6 Marks)**

Question FOUR

- (a). Describe **TWO** methods of setting out right angles from the chain line using a tape only. **(6 marks)**
- (b). State **FOUR** systemic/cumulative errors in chain surveying. **(4 Marks)**
- (c). Describe the following types of staffs:
- (i) Describe the following types of staffs:
- (I). Telescopic staff
 - (II). Folding staff
 - (III). Folding staff
 - (IV). Rigid staff
- (3 Marks)**
- (d). During a survey, the following staff readings were observed 2.00, 3.00, 1.00, 3.00 and 2.50. The 2nd, 3rd and fourth readings were taken with an inverted staff under a bridge. Reduce the levels using Height of Collimation method and carryout with arithmetical checks. **(7 Marks)**

Question FIVE

- (a). Describe the Geographical positioning system. **(5 Marks)**
- (b). Briefly describe these methods of determining contours:
- (i). Direct
- (ii). Indirect **(15 Marks)**