



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

DIPLOMA IN CIVIL ENGINEERING DIPLOMA IN ARCHITECTURE

SEMESTER EXAMINATIONS

MAY 2010 SERIES

EB 2129 : SURVEY II

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination:

- Answer booklet
- Pocket Calculator
- Pencil
- Eraser

This paper consists of **FIVE** Questions. Answer **THREE** questions **ONLY**. Question **ONE** is **COMPULSORY**. Maximum marks to each part of a question are all shown.

Question ONE

- (a). Shown in the table 1 are stadia tacheometric survey observation with the instrument held vertically. The instrument constants were 100 and 0. Given the reduced level of the instrument station as 570.00m. Calculate:-
 - (a) Distance S,T
 - (b) The difference in height between RS and RT
 - (c) The reduced level of points S and T
 - (d) Difference in height between S and T
 - (e) Area in square metres
 - (f) The partial Northings of line RS.

Table 1

Instrument Station	To station	Horizontal angle	Vertically angle	Staff readings	Height instrument
R	S	060800	+530	1.250, 1.500, 1.750	1.600
	Т	560800	-130	2.450, 3.110, 3.775	1.600

(20 Marks)

(b). A closed compass traverse ABCD was conducted round a dam and the bearings shown in table 2 were obtained. Determine which of the stations are suffering from local attraction and give the values of the corrected bearings.

Table 2

Line	Fore-bearing	Back-bearing
AB	74°20`	256°00`
BC	107°20`	286°20`
CD	224°50`	44°50`
DA	306°40`	126°00`

(10 Marks)

Question TWO

- (a). Define the following terms as applied in the theodolite work.
 - (i) Centering
 - (ii) Swing
 - (iii) Face right reading
 - (iv) Trunnion axis
 - (v) Levelling

(5 Marks)

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N 45° 30` W S 45°W (ii) (ii)

(iv)

Convert the following quadrantal bearings into whole circle bearing:-

(ii)

(iv)

Convert the following whole circle bearings into quadrantal bearings:-

190°20`

°00°08

N 89° 10` E

(c).	(i)	State TWO merits and TWO demerits of a compass traverse as compared to other methods of surveying.		
	(ii)	State any TWO uses of a compass traverse.	(4 Marks)	

- (b). (ii)
- Define the term tacheometry (i) Differentiate between stadia and tangential systems of tacheometry.

12°16`00``

43°39`20``

207°53`40``

12°16`20``

Y А В С 141°06`20``

To point

D А

Question THREE

Reputation

Table 3

Instrument

(i)

at

Question FOUR

(i)

(iii)

(iii)

350°40`

170°10`

S 60° 29` E

(a).

(b).

- The table 3 below shows horizontal circle readings about a point. (a). Reduce the angles using an angular booking table and illustrate the configuration of the station on a sketch.
- Outline the procedure of the following horizontal angular measurement (c). methods by use of a theodolite
- Briefly explain the collimation adjustment of a theodolite. (b). (10 Marks)

(7 Marks)

192°16`20``

223°40`20``

321°07`40``

27°54`20``

192°17`20``

(7 Marks)

(4 Marks)

(4 Marks)

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(3 Marks)

(c). Write the back bearing of the following bearings:-

(i)	180°30`	(ii)	80°30`	
(iii)	380°40`	(iv)	220°20`	(4 Marks)

(d). Define the following terms as used in compass traverse.

- (i) Angle of declination
- (ii) Isogonal
- (iii) Local attraction
- (iv) Magnetic meridian

Question FIVE

(a). Take the datum co-ordinates of two points as shown in table 4. Compute the distance and bearing between A and C.

Table 4

	E	N
Α	2496.769	2009.577
С	2983.699	2122.274

(5 Marks)

(8 Marks)

(b). A T2 theodolite having a multiplying constant of 100 and an additive constant of 0 was centred and leveling at a height of 1.58m above point 'P' of reduced level 100.00m. A leveling staff was held vertically at points 'X' and 'Y' in turn and the readings shown in Table 5 were recorded.

Table 5

Staff position	Staff reading (m)	Vertical circle	Horizontal circle reading
X	2.140, 1.956, 1.774	+02°17`27``	28°44`11``
Y	2.082, 1.815, 1.546	-03°16`14``	95°12`52``

Calculate:-

- (i) The reduced level of point "X" and "Y"
- (ii) The horizontal distance PX and PY.

(15 Marks)