



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

CERTIFICATE IN CONSTRUCTION TECHNICIAN II
(09A)

SEMESTER EXAMINATIONS

APRIL/MAY 2010 SERIES

EB 1117 - SURVEYING (TRAVERSING)

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examinations:

- Question paper
- Answer booklet
- Scientific calculator

This paper consists of **FIVE**, Questions.
Answer Question **ONE** and any other **TWO** Questions.
The maximum marks for each part of a question are as shown.

Question ONE

- (a). Define the following terms as used in compass traversing:-
- (i). Angle of declination
 - (ii). Magnetic meridian
 - (iii). Isogonals
 - (iv). Agonic line
- (5 Marks)**
- (b). (i). Differentiate between secular and Dirnal variation.
(ii). List **THREE** types of periodic variations.
- (5 Marks)**
- (c). Illustrate diagrammatically the various features of a prismatic compact.
- (7 Marks)**
- (d). State **TWO** merits and **ONE** demerit of a compass traverse.
- (3 Marks)**
- (e). The information shown in table 1 is for a link traverse P, 1, 2, 3, 4, 5, Q. Calculate:
- (i). The total co-ordinates of points 1, 2, 3, 4, 5 and Q given those of P as P: 3000.00mE, 5000.00 mN.
 - (ii). The length and bearing of line P, Q.
- (10 Marks)**

Table 1

Line	Length (m)	Partial Easting	Partial Northing
P1	135.76	+88.955	-102.555
12	129.11	+101.221	+80.151
23	155.33	+91.271	-125.682
34	195.38	+81.234	+177.688
4 – 5	50.77	+60.251	-80.171
5 – Q	115.64	+25.678	+112.753

Question TWO

- (a). State any **THREE** uses of a compass traverse.
- (3Marks)**
- (b). The readings for a compass traverse are as shown in table 2. Adjust the traverse for local attraction.

Table 2

Line	Forward Bearing	Back Bearing
1 – 2	157° 30′	337° 15′
2 – 3	77° 30′	257° 45′
3 – 4	354° 00′	174° 15′
4 – 5	302° 45′	122° 45′
5 – 6	190° 15′	10° 30′
6 – 1	224° 30′	44° 45′

(17 Marks)**Question THREE**

(a). Convert the following whole circle bearings into reduced bearings:

- (i). 130° 45′ 05″
- (ii). 305° 14′ 17″
- (iii). 782° 40′ 50″
- (iv). 1578° 18′ 10″

(5 Marks)

(b). Given the total co-ordinates of points J and K as J:910.00 mE, 25.56mN; K: 256.80m, 815.95mN. Calculate the length of bearing of line JK, using a Join computation table.

(6 Marks)

(c). The internal angles of a closed polygonal traverse are shown in table 3. Calculate the corrected whole circle bearings of lines BC, CD, DE, EF and FA given the whole circle bearing of line AB as 160° 10′ 00″.

(9 Marks)**Table 3**

Line	Angle		
	°	′	″
AB	111	41	42
BC	100	2	52
CD	96	26	07
DE	128	37	40
EF	167	55	21
FA	215	16	18

Question FOUR

(a). State the advantages of a compass traverse compared to other types of traverses. **(3 Marks)**

(b). Define the following terms:-

- (i). Co-ordinate system
- (ii). Polar Co-ordinates
- (iii). National Grid North

(8 Marks)

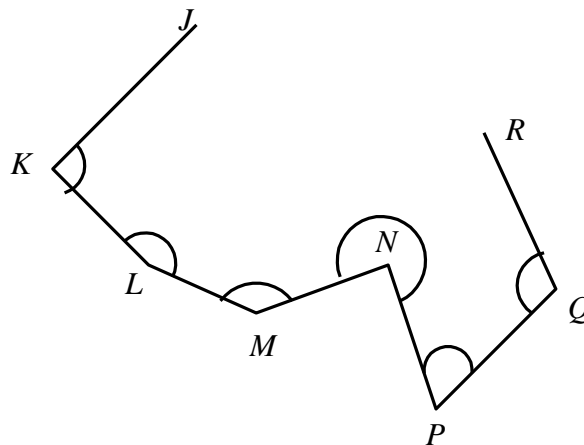
(c). Table 4 shows the clockwise angles of a closed Link traverse J, K, L, M, N, P, Q, R. Given the whole circle bearings of lines JK and QR as:

JK 255° 10' 50''
 QR 350° 03' 40''

Adjust the tranverse for angular misclosure.

Table 4

Line	Clockwise Angle		
	°	'	''
JK	89	50	10
LM	125	6	7
MN	151	10	15
NP	275	15	25
PQ	92	50	50
QR	80	40	10



(12 Marks)

Question FIVE

- (a). With the aid of a sketch explain the field procedure of a compass traverse. **(10 Marks)**
- (b). With the aid of a sketch, explain the graphical adjustment procedure of a compass traverse. **(10 Marks)**