



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING
DIPLOMA IN CIVIL ENGINEERING & COMPUTER (DCC 09)
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 09)

EBC 1117: TRAVERSE SURVEYING

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

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 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 **FOUR** printed pages

SECTION A (COMPULSORY)

Question 1 (30 marks)

a) Define the following terms:

- (i) Compass traverse
- (ii) Isogonals
- (iii) Variation of declination
- (iv) Local attraction

(6 marks)

b) Table 1 shows the included angle between AB and AC. Calculate the internal included angle.

Table 1

(8 marks)

| | | | | | | |
|-------|----|-------|------|----|-------|------|
| (i) | AB | N 30° | 10'E | AC | N79° | 45'E |
| (ii) | AB | N 15° | 40'E | AC | S 50° | 40'E |
| (iii) | AB | S 45° | 00'E | AC | N 45° | 30'E |
| (iv) | AB | N 60° | 30'E | AC | N 30° | 25'W |

c) The bearing of a closed traverse ABCDE are as shown in table 2

Table 2

| Line | Forward bearing | Back bearing |
|------|-----------------|--------------|
| AB | 107° 15' | 287° 15' |
| BC | 22° 00' | 202° 00' |
| CD | 281° 30' | 101° 30' |
| DE | 181° 15' | 1° 15' |
| EA | 124° 45' | 304° 45' |

Compute the interior angles of the traverse and apply the necessary checks

(12 marks)

d) Compute the back bearing of the following bearings.

- (i) 60° 30'
- (ii) 210° 45'
- (iii) 133° 00'
- (iv) 350° 05'

(4 marks)

SECTION B (Answer any TWO questions from this section)

Question 2 (20 marks)

a) Define the following terms:

- (i) Whole circle bearing
- (ii) Partial co-ordinates
- (iii) Polar co-ordinates
- (iv) Join

(8 marks)

- b) Outline **THREE** uses of compass traverse (3 marks)
- c) State **SIX** points to be considered when selecting station for a compass traverse (9 marks)

Question 3 (20 marks)

- a) Convert the following whole circle bearings into quadrantal bearings
- (i) 68° 30'
 - (ii) 210° 00'
 - (iii) 300° 40'
 - (iv) 120° 35'
- (4 marks)
- b) Define the following terms.
- (i) Angles
 - (ii) Bearings
 - (iii) Magnetic meridian
 - (iv) Local meridian
 - (v) Grid meridian
 - (vi) Co-ordinate system
- (9 marks)
- c) With the aid of a sketch, illustrate the construction of a prismatic compass (7 marks)

Question 4 (20 marks)

- a) The internal clockwise angles of a closed polygonal traverse are as shown in Table 3. Calculate and tabulate the corrected bearings, given the whole circle bearing of line AB as 100° 00' 00"

Table 3

| Angle | Observed Value | | |
|-------|----------------|-----|-----|
| ABC | 120° | 20' | 00" |
| BCD | 86° | 00' | 40" |
| CDE | 341° | 34' | 20" |
| DEF | 60° | 22' | 00" |
| EFA | 100° | 22' | 20" |
| FAB | 11° | 14' | 10" |

(12 marks)

- b) Table 4 shows the datum co-ordinates of points T1 and T2

Table 4

| | | |
|----------------|-----------|----------|
| T ₁ | 1673.1ME, | 1377.6mN |
| T ₂ | 1477.8ME, | 1106.9Mn |

Compute the distance and bearing of T₁ – T₂ (6 marks)

- c) State any **TWO** merits of compass traversing (2 marks)

Question 5 (20 marks)

- a) Table 5 shows magnetic bearings in which is expected a local attraction presence. Use the readings to calculate the bearings corrected for local attraction (15 marks)

| Line | Forward bearing | Back bearing |
|------|-----------------|--------------|
| AE | 319° 00' | 135° 30' |
| AB | 72° 45' | 252° 00' |
| BC | 349° 00' | 167° 15' |
| CD | 298° 30' | 118° 30' |
| DE | 229° 00' | 48° 00' |

- b) State the conversion of the forward bearing of a line into its back bearing in Quadrantal bearing system (5 marks)