



MACHAKOS UNIVERSITY

University Examination 2019/2020

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

DIPLOMA IN CIVIL ENGINEERING

BCECD 205: ENGINEERING SURVEY II

DATE: 4/12/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) Explain the functions of optical plummet and centering motion of a theodolite (6 marks)
- b) Briefly explain the mechanism of the upper and lower plates (5 marks)
- c) State FIVE gross errors likely to be observed in a theodolite (10 marks)
- d) Briefly explain random errors and gross errors in a theodolite (9 marks)

QUESTION TWO (20 MARKS)

- a) Make a neat sketch of the front view of a theodolite and name all the parts (10 marks)
- b) Briefly explain the procedure of setting up a theodolite (10 marks)

QUESTION THREE (20 MARKS)

- a) Briefly explain the term bearing (2 marks)
- b) Outline the meaning of the following terms
 - i. True Bearing
 - ii. Magnetic Bearing (12 marks)
 - iii. Magnetic Declination
 - iv. Geographical position
- c) Convert the following whole bearings into quadrant Bearings (6 marks)
 - 1) $58^{\circ} 40'$ 2) $252^{\circ} 20'$ 3) $125^{\circ} 40'$

QUESTION FOUR (20 MARKS)

- a) Convert the following quadrant circle bearings into whole circle bearings
- i. $58^{\circ} 40' W$
 - ii. $531^{\circ} 20E$
 - iii. $S 04^{\circ} 10'W$
 - iv. $N87^{\circ} 20'E$ (10 marks)
- b) Make simple sketch to show the relationship between the following types of bearings
- i. Magnetic bearing
 - ii. True bearing
 - v. Magnetic Declination (10 marks)
 - iii.

QUESTION FIVE (20 MARKS)

- a) Differentiate between open traverse and closed traverse (5 marks)
- b) Include missing quantities in the table below (10 marks)

	1	2	3	4
Magnetic Bearing	65°	228°		324°
True Bearing		234°	129°	317°
Magnetic Declination	$11^{\circ}W$		$5^{\circ}E$	

- c) Differentiate between Forward Whole circle bearing (WCB) and Back Whole Circle bearing (5 marks)