(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DIPLOMA

IN

CIVIL ENGINEERING / BUILDING CONSTRUCTION

COURSE CODE: DCE /DBC 072
COURSE TITLE: SURVEYING II
DATE: WEDNESDAY 27ᵀᴴ APRIL 2022 TIME: 8.00AM – 10.00AM

INSTRUCTIONS:
1. Answer Question **ONE** and any other **THREE** Questions
2. Marks for each question are indicated in the parenthesis.
3. Examination duration is **2 Hours**

MMUST observes ZERO tolerance to examination cheating
This Paper Consists of 3 Printed Pages. Please Turn Over.

SECTION A (30 MARKS)

QUESTION ONE (COMPULSORY)

a) The following offsets were taken from a chain line to an irregular boundary line at an interval of 10 m. 0, 2.50, 3.50, 5.00, 4.60, 3.20, 0 m. Compute the area between the chain line, the irregular boundary line and the end offsets by: (5 Marks)
   i.   Trapezoidal Rule (5 Marks)
   ii. Simpson's Rule

b) Outline the procedure of setting up a theodolite exactly over a station mark (6 Marks)

c) List TWO Tacheometric methods in engineering surveying (2 Marks)

d) Describe FOUR types of horizontal curves (4 Marks)

e) Describe FOUR sources of errors in angle measurement (4 Marks)

f) Name FOUR parts of a digital theodolite and how they are used (4 Marks)

SECTION B (40 MARKS)

QUESTION TWO (20 MARKS)

a) The areas within contour lines at the site of a reservoir and along the face of the proposed dam are as follows.

Contour	Area (m^2)
300	738 780
298	708 870
296	693 900
294	506 880
292	241 500
290	98 480
288	50 010
286	31 680

   i.   Find the volume by End area rule (5 Marks)
   ii. Find the volume by Simpson's rule (5 Marks)

b) Calculate the side widths and cross-sectional areas of cut and fill on a hillside section (Figure 1) having the following dimensions: (10 Marks)

Formation width = 20 m, existing ground slope =1 in 5 (20%)

Side slope in cut =1 in 1 (100%), Centre height in cut = 1m
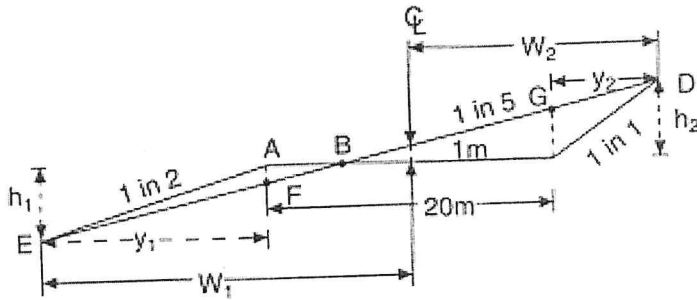
Side slope in fill = 1 in 2 (50%)

Figure 1

QUESTION THREE (20 MARKS)

a) The stadia reading with horizontal sight at a vertical staff held 50m away from the tacheometer were 1.385 and 2.380. The focal length of the object glass was 25cm. The distance between the object glass and trunnion axis of a tacheometer was 15cm. Calculate the stadia interval. (6 Marks)

b) With the aid of diagrams, describe the following types of curves. (5 Marks)
   i) Simple curve (5 Marks)
   ii) Compound curve (4 Marks)

c) Name four types of vertical curves

QUESTION FOUR (20 MARKS)

a) Define the following terms used in Theodolites

   i. Face left reading

   ii. Face right reading

   iii. Transiting

   iv. Centering (8 Marks)

b) State the difference between temporary and permanent theodolite adjustments (2 Marks)

c) Discuss FIVE uses of mass haul diagrams (10 Marks)

QUESTION FIVE (20 MARKS)

a) Explain any FOUR causes of each of the following types of errors in surveying
   i) Gross errors (4 Marks)
   ii) Random Errors (4 Marks)
   iii) Systematic errors (4 Marks)

b) Discuss the procedure of Volume determination from Spot levels. (8 Marks)