L40

(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

THIRD YEAR SEMESTER TWO MAIN EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF TECHNOLOGY EDUCATION IN BUILDING AND CIVIL TECHNOLOGY

COURSE CODE: TEB 342

COURSE TITLE: ENGINEERING SURVEYING II

DATE:WEDNESDAY 27TH APRIL 2022 TIME: 8:00 – 10:00 AM

INSTRUCTIONS:

1. This paper consists of **FOUR** questions.
2. **ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS.**
3. Marks for each question are indicated in the parenthesis.
4. The paper is strictly 2 hours.

Question ONE (30 Marks)

a) Outline any THREE uses of angular measurement in survey. (3mks)

b) Differentiate between the following terms used in Survey.

i) Traversing and Tacheometry (2mks)

ii) Line of sight and Transiting (2mks)

iii) Theodolite and Total station (2mks)

c) By use of a sketch, show that the Total Area of a planning site bounded by a river on one side can be given by

$$A = \frac{W}{2}\{h_1 + 2(h_2 + h_3 + ...h_{n-1}) + h_n\}$$ (5 marks)

d) Outline any FOUR sources of errors that may be encountered during traversing. (4mks)

e) Explain the principle of traversing. (2mks)

f) Explain the following terms used in Survey

i) Consolidation (1mks)

ii) Bulking (1mks)

g) An open storm water drain was to connect a gated community to the nearby river. The design data were as follows: plan width=2.8m, center height = 0.4m, formation width=1.6m.

i. Calculate the side slope of the drain (2mks)

ii. Calculate the cross-sectional area enclosed (2mks)

h) Calculate the volume using End areas method of water in the lake between 182m and 190m contour given by the area within the underwater contour lines of a lake are as follows: (4 Marks)

Contour (m above datum)	190	188	186	184	182
Area (m2)	3150	2460	1630	840	210

QUESTION TWO

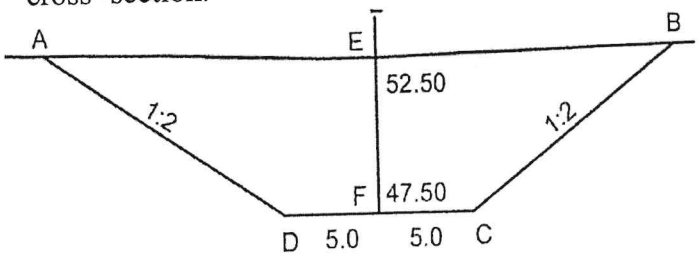
a) Define contouring as applied in land survey. (2mks)

b) With an aid of a diagram, Explain how an area of irregular surface may be obtained using graphical method (4mks)

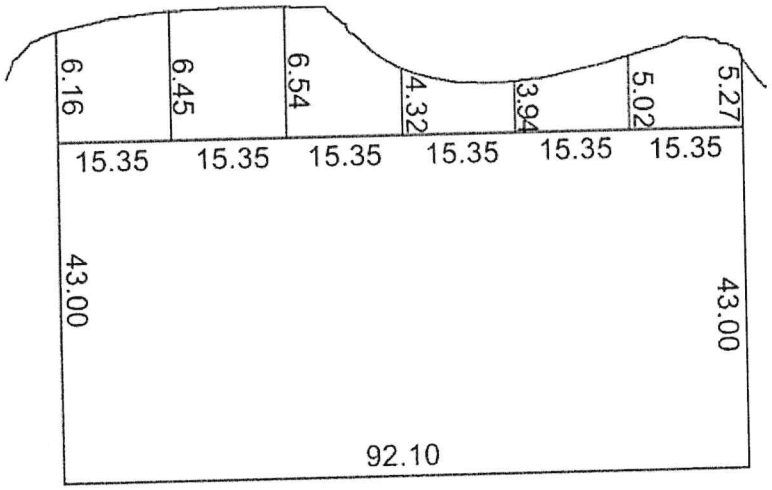
c) A series of perpendicular offsets were taken from a baseline to a curved boundary of a river as indicated in the table. Determine the area enclosed using Trapezoidal rule (4mks)

Distance (m)	0	10	20	30	40	50	60	70
Offset (m)	2.2	2.6	0.85	1.24	2.05	1.66	1	0.84

d) Consider a trapezoidal channel shown below to be constructed on the side of a road. The level at the centers was picked as 52.5m and 47.50m below. Calculate the area of the cross -section. (4mks)



e) Calculate the area of the figure below using Simpson's formula (4mks)



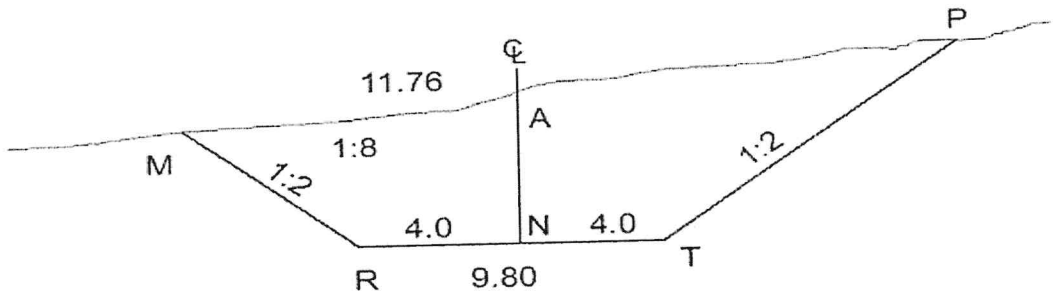
f) Outline any TWO methods used for calculating earthworks. (2mks)

QUESTION THREE

a) Distinguish between open traverse and close traverse as applied in Survey. (4mks)

b) Distinguish between Give and Take method and the graphical method of irregular area estimation stating TWO factors each that influence the accuracy level of each method. (4mks)

c) Calculate the area of a two level section shown below. (8mks)



d) Convert the following quadrant readings to whole circle bearings

i. N 12 ^{0} 24''E (1mk)

ii. S 31 ^{0} 36'' E (1mks)

e) Differentiate between a loop traverse and a link traverse. (2mks)

QUESTION FOUR

a) Using a labeled and neat sketch, illustrate and briefly explain the principle of stadia tachometry. (5mks)

b) Outline any FIVE temporary adjustments to the equipment's. (5mks)

c) The following records were obtained from the field while carrying out traversing. Compute the latitudes, departures and error closure hence the precision. (10mks)

	Bearing		Length (ft)
	Degrees	Minutes	
AB	S 6	15 W	189.53
BC	S 29	38 E	175.18
CD	N 81	18 W	197.78
DE	N 12	24 W	142.39
EA	N 42	59 W	234.58

QUESTION FIVE

a) Explain any TWO purposes of reconnaissance procedure during field traverse measurements. (2mks)

b) Discuss any TWO purposes of traversing. (4mks)

c) Explain any FOUR applications of tachometric method in survey (4mks)

d) Name any TWO instruments that can be used in Tachometry (2mks)

e) Calculate the cross- section area of the three level figure below: (8mks)