(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

MAIN EXAMINATION

FOR THE DEGREE OF
BACHELOR OF SCIENCE IN GEOSPATIAL INFORMATION SCIENCE

COURSE CODE: DPG 201
TITLE: SURVEYING II

DATE: 15/12/2023   **TIME:** 12-2PM

INSTRUCTIONS TO CANDIDATES

This paper contains **four (4)** questions
Question **One (1) is compulsory (30 Marks)**
Attempt **any other Two Questions from section II**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over ➜

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SECTION 1: COMPULSORY [30 MARKS]

Question ONE

a) State any FOUR possible errors in Theodolite traversing and suggest corresponding mitigation measures to enhance accuracy (4mks)

b) By use of a sketch, show that total area of a planning site bounded by a river can be given by:

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

(4mks)

c) Given the angular measurements of a loop traverse. Calculate the included angles (5mks)

	Target Stn	F.L Rdg	F.R Rdg
Inst@Q	A	024⁰ 32' 05''	204 ⁰ 32' 08''
	B	120⁰ 06'10''	300 ⁰ 05' 58''
	C	215⁰ 42' 44''	035 ⁰42' 50''
	D	284⁰ 58' 08''	104 ⁰ 57' 59''
	A	024 ⁰ 32' 12''	204 ⁰31' 56''

d) Explain the temporary adjustment of a theodolite during a field traverse survey (5mks)

e) Explain the principle of traversing (2mks)

f) Given the data in the table below, compute the capacity of the water reservoir by END area formula. Assume the spillway coincide with the last contour (5mks)

Contour (m)	25	30	35	40	45	50	55
Area enclosed in (m²)	13.5	13.8	14.0	14.4	14.9	15.2	16.0

g) Explain any THREE applications of tachometric survey (3mks)

h) With respect to a theodolite, explain the functions of the following parts
   i.   Telescope (1mk)
   ii.   Vertical circle (1mk)

SECTION II: ATTEMPT ANY OTHER TWO (2) QUESTIONS [40 MARKS]

Question TWO

a) 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)

b) 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)

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 Degrees Minutes		Length (ft)
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 THREE

a) Using a labeled and neat sketch, illustrate and briefly explain the principle of stadia tachometry (5mks)
b) During a Tachy practical and using a conventional theodolite who's multiplying and additive constants are 100 and 0 respectively, the following data was captured:
Height of the Instrument at A= 1.65m   Reduced level at A=2050.95M

Inst. Stn	Sighted Stn	Stadia Readings (m)		V.A	H.A
		Upper	Lower		
A	B	4.35	3.05	$+5^0\ 30'$	$87^0\ 00'$
	C	2.05	1.00	$+8^0\ 15'$	$159^0\ 00'$

    Compute the horizontal distance between station B and C (5mks)
c) With an aid of a diagram, Explain how an area of irregular surface may be obtained using graphical method   (4mks)

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 (3mks)
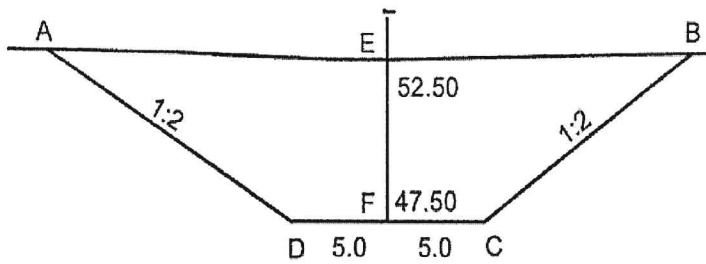
e) Explain the following terms used in Survey
   i)   Consolidation   (1mk)
   ii) Bulking   (1mk)
   iii) Contouring   (1mk)

Question FOUR

a) Convert the following whole circle bearing to reduced bearing (3mks)
   i. $132^0 \, 45'56''$
   ii. $312^0 \, 05'24''$
   iii. $255^039'40''$

b) Using an illustration, show that the volume of a ground tank can be obtained from
   $$V = \tfrac{1}{4} \, Area \, (\Sigma h_1 + \Sigma h_2 + \Sigma h_3 + \Sigma h_4) \qquad \text{(4mks)}$$

a) The figure below shows the x-section of a land surface from a trapezoidal channel is to be excavated. Calculate the area of the cross section   (7mks)
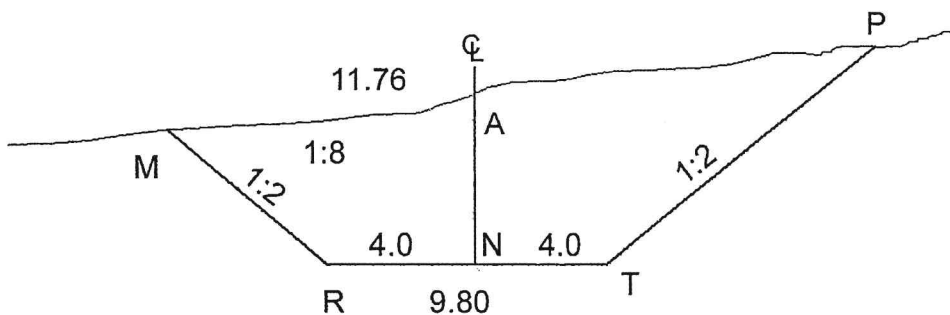
c) A level grid was placed over a house lot, as shown below.
   Calculate the volume of fill required to level the lot to a RL of 15.00 metres (6mks)

Stanley Street

Wright Way

60   10   80   10   00
13   14   14   14   15
20   40   90   10   70
14   14   14   13   14
00   60   80   30   10
13   14   13   13   14

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