



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS**

**MAIN EXAMINATION**

**FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN GEOSPATIAL INFORMATION  
SCIENCE**

**COURSE CODE: DPG 106**

**COURSE TITLE: SURVEYING I**

**DATE: - 24/4/2023**

**TIME: 12-2 PM**

---

**INSTRUCTIONS TO CANDIDATES**

This paper contains five (5) questions

Question one (1) is compulsory {total = 30 Marks}

Attempt any other two (2) {total = 40 Marks} from the remaining questions

Be brief and to the point

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over ⇨

## SECTION I: COMPULSORY {30 MARKS}

### Question ONE

- a) Name any two (2) types of equipment that may be required during ground chaining (2mks)
- b) Outline any three (3) characteristics of a contour line (3mks)
- c) State the functions of the following parts of a level
  - i) Telescope (1mk)
  - ii) Level tube (1mk)
- d) Differentiate between the following types of survey
  - i) Engineering survey and cadastral survey (4mks)
  - ii) Geodetic survey and Hydrographic survey (4mks)
- e) Using an illustration, explain the field procedure of leveling which starts and ends on a bench mark (6mks)
- f) Using an illustration, explain how a give and take method can be used to obtain the areas of irregular shapes (2mks)
- g) By use of a suitable illustration and appropriate equations, explain how spot heights can be used to estimate volume of a designed underground tank (5mks)
- h) Describe the procedure of ground chaining (6mks)

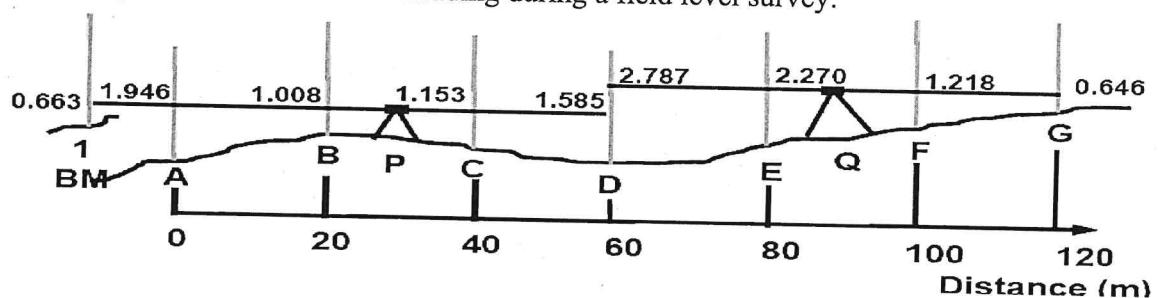
## SECTION II: ATTEMPT ANY OTHER TWO (2) QUESTIONS {40 MARKS}

### Question TWO

- a) Discuss the process of temporary adjustments for levels during field survey (5mks)
- b) The following staff readings were observed successively with a leveling instrument, the leveling instrument was shifted after the fifth reading: 0.663, 1.946, 1.008, 1.153, 1.585, 2.787, 2.270, 1.218 and 0.646. If the first reading was taken on a bench mark whose reduced level was 98.76m, book and reduce the readings using the HC method and show the usual checks (9 Mks)
- c) Explain any three (3) applications of leveling in geographic mapping and engineering planning (6mks)

### Question THREE

- a) The figure below shows staff reading during a field level survey:



- a) Rule out a page of a standard level field book and enter the above staff readings. Calculate the reduced levels of the points using the Rise and Fall Method and show the usual checks. (8mks)
- b) Distinguish between direct and indirect linear measurement and give at least one example of each. (4mks)
- c) Explain any three corrections that may be applied on measured distances using tapes or chains (6mks)
- d) Distinguish between accuracy and precision as used in survey (2mks)

**Question FOUR**

- a) Outline any two (2) permanent adjustments for levels (2mks)
- b) Explain any three (3) causes of errors in leveling (3mks)
- c) Using an illustration, explain how graphical method can be used to obtain the area of a planning site bounded by a river. (4mks)
- d) Explain any three (3) obstacles that may be encountered during chain survey (3mks)
- e) 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 Simpson's 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

- f) Explain any two leveling techniques that may be used during a level survey (4mks)

**Question FIVE**

- a) Explain any four (4) objectives of reconnaissance during field level survey (4mks)
- a) Explain any three (3) characteristics of a field notebook (3mks)
- b) With illustrations, explain how slope correction can be carried out on linear measurements (4mks)
- c) Using illustrations, explain the principle of electromagnetic distance measurement (6mks)
- d) Explain any three (3) errors that may occur in horizontal distance measurement and state how each can be controlled (3mks)