



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

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

**BACHELLOR OF SCIENCE IN GEOSPATIAL INFORMATION
SCIENCE (GIS)**

COURSE CODE: DPG 104

COURSE TITLE: ENGINEERING SURVEY I

DATE: 21/04/2022

TIME: 3 - 5PM

INSTRUCTIONS TO CANDIDATES

Answer Question 1(ONE) and any other TWO Questions

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

QUESTION ONE (COMPULSORY - 40MARKS)

- a) Define the following terms
- i) Surveying **(2marks)**
 - ii) Leveling **(2marks)**
- b) Differentiate between the two branches of surveying **(4marks)**
- c) Explain the two principles of surveying **(3marks)**
- d) The following staff readings were observed successively with a leveling instrument having been moved after third, sixth and eighth readings: 2.300: 1.600: 1.100: 2.000: 2.900: 1.300: 0.600: 2.100: 1.000: 2.700 metres. Draw a level book page, enter the readings and calculate the reduced levels of points if the first reading was taken with a staff held on a bench mark of 450.400m using Rise and Fall method **(6marks)**
- e) What is a station in surveying? Illustrate how the stations are identified in field work if the first station is at zero measurement and station intervals are 100m. Show the markings for 250m, 456m, 892.33m and 89m. **(4 marks)**
- f) i) Distinguish between the azimuth and bearing. **(2marks)**
- ii) . The following azimuths are reckoned from the north. FE = 4° , ED = 90° , DC = 271° , CD = 320° and BA = 190° . What are the corresponding bearings? **(5marks)**
- g) Outline the considerations taken into account when choosing the contour interval in contouring process **(4marks)**
- h) A road actually 1330 m long was found to be 1326 m when measured with a defective 30 m chain. How much correction does the chain need? **(4marks)**
- i) Describe how the obstacles in chain surveying are categorized? **(4marks)**

QUESTION TWO

- a) Explain any three types of errors in surveying **(3marks)**
- b) outline the objectives of leveling in surveying **(2marks)**
- c) The following staff readings were observed successively with a leveling instrument having been moved after third, sixth and eighth readings: 2.300: 1.600: 1.100: 2.000: 2.900: 1.300: 0.600: 2.100: 1.000: 2.700 metres. Draw a level book page, enter the readings and calculate the reduced levels of points if the first reading was taken with a staff held on a bench mark of 450.400m using Height of collimation method **(5marks)**
- d) The following consecutive readings were taken with a level and 5 metre leveling staff on a continuously slopping ground at a common interval of 20metres: 0.385; 1.030; 1.925; 3.730; 4.685; 0.625; 2.005; 3.110; 4.485. The reduced level of the first point was 208.125 m. Rule out a page of the field book and enter the

above readings. Calculate the reduced levels of the points by rise and fall method also the gradient of the line joining the first and last point. **(5marks)**

QUESTION THREE

- a) State instruments used in chain surveying. **(3marks)**
- b) Explain the following terms as applied in chain surveying.
 - i) Chain triangulation **(2marks)**
 - ii) Check lines **(2marks)**
 - iii) Survey station **(2marks)**
- c) The distance between two points A and B measured along a slope is 504 m. Find the horizontal distance between A and B when (a) the angle of slope is 15° , (b) the slope is 1 in 4.5, and (c) the difference in elevation of A and B is 65m. **(6marks)**

QUESTION FOUR

- a) Describe any six characteristics of contours **(6marks)**
- b) Discuss various methods of contouring. Discuss the merits and demerits of each **(9marks)**

