KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF
B.SC (RENEWABLE ENERGY)

COURSE CODE: REN 216

COURSE TITLE: ENGINEERING SURVEY

DURATION: 2 HOURS

DATE: 23/12/2022 **TIME: 9:00-11:00AM**

INSTRUCTIONS TO CANDIDATES

Answer **Question 1 (Compulsory)** and any other **TWO** questions

This paper consists of **3** printed pages. Please Turn Over

QUESTION ONE 30 MARKS COMPULSORY

a) Define the term engineering survey **(2marks)**

b) Distinguish between the following types surveys **(4marks)**

i. Cadastral and topographic survey

ii. Plane and geodetic survey

c) State and explain 4 sources of errors in survey. **(4marks)**

d) Determine the pacing factor for a student having 42 forward paces and 43 backward paces over a distance of 40m. Using the pacing factor obtained estimate the distance for 40 average number of paces **(5marks)**

e) Given the upper stadia reading to be 2.56 m and the lower stadia reading to be 0.78 m , determine the horizontal distance .Take k= 100 and $\theta = 0^0$ **(3 marks)**

f) State five advantages of plane table survey **(5marks)**

g) i. Differentiate between profile leveling and differential leveling **(2marks)**

ii. Outline five uses of leveling **(5marks)**

QUESTION TWO 20 MARKS)

a. A steel tape of nominal length 30m was used to measure a line AB by suspending it between supports. The following measurements were recorded.

Line	Slope angle	Length measured	Mean temperature.	Tension (N)
AB	8	29.872	7°C	110

The standardized length of the tape against a reference tape was known to be 30.014 m at 20°C and 50 N tensions. If the tape weighs 0.17 N m^{-1} and has a cross-sectional area of 4 mm^{-2}. Calculate the horizontal length of AB, given the Young's modulus (E) for the tape material is 200 KN mm^{-1} and the coefficient of thermal expansion ( ) is 0.0000112 per °C. **(12mks)**.

b. Discuss the methods that are used in linear measurement (8 marks).

QUESTION THREE (20 MARKS)

a. The following readings were taken in a leveling exercise in a sequence with 1st, 7th and 10th readings being back sights 2.554, 1.783, 0.926, 1.963, 3.587, 1.305, 1.432, 0.573, 3.350, 1.925, 0.496. The reduced level the bench mark was 150.0m above sea level. Using height of rise and fall method, book the readings, determine elevation of other points and carry out the necessary arithmetic check. **(17 marks).**

b. Draw the profile for the area **(3marks)**

QUESTION FOUR (20 MARKS)

a. Discuss the four methods of plane table survey. **(16marks)**

b. Briefly describe FOUR instruments used in Plane Table Surveying.**(4 marks)**

QUESTION FIVE (20 MARKS)

a. Discuss the merits and demerits of the method used in direct distance measurement (**10 marks)**

b. Describe the procedure used in traverse survey (**10 marks)**