MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATIONS

MAIN EXAMINATION

FOR THE DEGREE OF
BACHELOR OF SCIENCE IN GEOSPATIAL INFORMATION SCIENCE

COURSE CODE: DPG 205

COURSE TITLE: GLOBAL POSITIONING SYSTEM (GPS) AND DATA COLLECTION

DATE: 14/4/2023   **TIME: 3-5 PM**

INSTRUCTIONS TO CANDIDATES

This paper contains **FOUR (4)** 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 2 Printed Pages. Please Turn Over →

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SECTION I: COMPULSORY (30 MARKS)

Question One

a) What is a Global Positioning System? (GPS)   **(1mark)**

b) What do you understand by the following terms as used in GPS satellite navigation and positioning?

    i.   Ephemeris   **(2marks)**

    ii.   RTK (Real-Time Kinematic)   **(2marks)**

    iii. Pseudo-range   **(2marks)**

    iv. Rover/Roving (GPS) Receiver   **(2marks)**

    v.   Base station   **(2marks)**

    vi. Dual-frequency (GPS) Receiver   **(2marks)**

c) What are the advantages and disadvantages of a Global Positioning System?   **(4marks)**

d) Briefly explain the working principle of a Global Positioning System   **(4marks)**

e) Describe the main components of NAVSTAR Global Positioning Systems   **(9marks)**

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

Question Two

a) Briefly explain the application of Global Positioning Systems in disaster management

                    (6marks)

b) Discuss any four (4) sources of errors in Global Positioning systems   **(8marks)**

c) Briefly discuss how a Global Position System's errors can be corrected   **(6marks)**

Question Three

Using examples and illustrations, discuss the methodology used in Global Positioning Systems (GPS) data collection   **(20marks)**

Question Four

a) Explain the following terms as applied in GPS positioning.

    i.   Accuracy   **(2marks)**

    ii.   Precision   **(2marks)**

b) Describe the two (2) categories of GPS positioning methods   **(6marks)**

c) Using illustrations derive the expression for the receiver's position in 3D given the position of 4 transmitters, and the measured pseudo-ranges from each satellite to the receiver's position.

                    (10marks)