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(University of Choice)

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

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATIONS

MAIN EXAMINATION

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

COURSE CODE: DPE 303

TITLE: REMOTE SENSING 1

DATE: 18/12/2023

TIME: 3-5PM

INSTRUCTIONS TO CANDIDATES

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

TIME: 2 HOURS

MMUST observes **ZERO** tolerance to examination cheating

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

SECTION I: COMPULSORY {30 MARKS}

QUESTION ONE

- a) Explain the three main types of atmospheric scattering **9 Marks**
- b) Discuss the factors that influence the choice of a sensor to use for a particular application **8 Marks**
- c) Explain the characteristics of satellite remote sensing that makes it an ideal source of data for different applications **8 Marks**
- d) All remote sensing imagery are inherently subject to geometric distortions. List any five factors that cause geometric distortions in remote sensing image data **5 Marks**

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

QUESTION TWO

- a) Outline the elements that aid visual image interpretation **12 Marks**
- b) Define the following terms as used in remote sensing.
 - i. Spatial resolution **1 Mark**
 - ii. Spectral resolution **1 Mark**
 - iii. Radiometric resolution **1 Mark**
 - iv. Temporal resolution **1 Mark**
- c) State Planck's law of radiation and explain its importance in remote sensing **4 Marks**

QUESTION THREE

- a) Discuss the use of Remote sensing in the field of agriculture **8 Marks**
- b) Giving examples, highlight three main types of platforms used in remote sensing **7 Marks**
- c) What is electromagnetic radiation? State two theories that describe electromagnetic radiation **5 Marks**

QUESTION FOUR

- a) The capability of a satellite to detect certain information depends largely on the design parameters of the satellite's orbit. Outline four relevant orbit design parameters for earth observation **8 Marks**
- b) Using an illustrative diagram, explain the principle of remote sensing **8 Marks**
- c) Distinguish between the following resampling techniques.
 - i. Bilinear interpolation **2 Marks**
 - ii. Cubic convolution **2 Marks**