GWANDA STATE UNIVERSITY

FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF GEOMATICS AND SURVEYING

INTRODUCTION TO DIGITAL MAPPING AND REMOTE SENSING

EGS 3101

Final Examination Paper

September 2023

This examination paper consists of 2 pages

Time Allowed: **3 hours**

Total Marks: **100**

Examiner's Name: Mr N.S. Maphosa

INSTRUCTIONS

Answer ALL **questions in chronological order**

1. Describe and explain the practical applicability of digital mapping and remote sensing in the mining and exploration industry [25].
2. Discuss the challenges and opportunities of using unmanned aerial vehicles (UAVs) for remote sensing and digital mapping applications. Provide examples of how UAVs can be used in various industries or fields [25].

3. (a) With aid of a diagram, describe and explain the basic principles of a remote sensing system and discuss the differences between passive and active remote sensing [15].
   (b) Explain basic characteristics of a digital image [10].

4. (a) With aid of a diagram, explain the concept of atmospheric windows [10].
   (b) Using fig 1, calculate NDVI and briefly explain the results [13].

Near Infrared Band

2.5	1.3	1.3	0.9
0.5	2.6	1.4	0.9
0.5	1	2.9	0.9
0.5	1	2	3

Red Band

0.99	0.6	0.95	1
0.33	1	0.95	1
0.33	0.5	2	1
0	0.55	1.75	1.3

5. (a) With the aid of examples, explain different types of image resolution in digital mapping and remote sensing [12].
   (b) Explain different image interpretation techniques as they are applied in digital mapping and remote sensing [13].