CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF EDUCATION ARTS**

GEOG 434: DIGITAL IMAGE PROCESSING

STREAMS: BED (ARTS) Y4S1   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 06/04/2021   **11.30 A.M. – 1.30 P.M.**

INSTRUCTIONS:
- **Answer question ONE and any other TWO questions**
- **Illustrations, diagrams and sketches should be used when necessary**

1. (a) Describe any FOUR components of image processing system   [16 marks]

    (b) The following is a 3x3 image pixel array

20	5	90
33	45	125
11	52	150

    (i)   Carry out linear contrast enhancement on digital number 45 by computing new
          digital number   [6 marks]

    (ii) Comment on the brightness value of the new digital number   [2 marks]

    (c) Differentiate between image Restoration and image enhancement   [6 marks]

2. Discuss the SEVEN steps that are followed when carrying out digital image processing

                                                                             [20 marks]

3. (a) Examine the THREE techniques employed during image spatial interpolation

    process of assigning new DNs to a pixel   [9 marks]

    (b) Contrast between Radiometric Calibration and Geometric Corrections [9 marks]

(c)   Name two image processing softwares   [2 marks]

4.   Examine any FIVE applications of Digital Image processing in human society

                                                            [20 marks]

5.   (a)   Explain THREE methods of carrying out change detection analysis (CDA) on a

       digital satellite imaging   [6 marks]

       (b)   Describe FOUR resolutions associated with digital images   [10 marks]

       (c)   State and explain the TWO categories of image classifiers   [4 marks]