CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF ARTS IN GEOGRAPHY

GEOG 434: DIGITAL IMAGE PROCESSING

STREAMS: B.A Y4S1   **TIME: 2 HOURS**

DAY/DATE: FRIDAY 13/12/2019   **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:
- **Answer question ONE and any other TWO questions.**
- **Diagrams and examples should be used when necessary**.

1.   (a)   Describe the SEVEN stages followed during satellite image processing.
                                                                                        (14 marks)
       (b)   Differentiate between radiometric calibration and geometric corrections.
                                                                                        (6 marks)
       (c)   Discuss FOUR techniques utilized when doing change detection analysis.
                                                                                        (10 marks)

2.   Discuss any FOUR methods of doing image contrast enhancement.   (20 marks)

3.   (a)   Explain why post classification editing is necessary.   (4 marks)

       (b)   Examine the THREE methods of interpolation used when doing spatial image
                 interpretation.   (12 marks)

       (c)   Carry out linear contrast stretch enhancement on the following image pixel array
                 for DN 25   (4 marks)

5	40	30
100	25	120
80	15	10

4. (a) Explain any TWO softwares used in image processing.   (4 marks)

    (b) Discuss any THREE techniques applied in supervised image classification.
                                                                    (9 marks)
    (c) Examine the various accuracies deciphered from an error matrix during accuracy
         assessment.   (7
marks)

5. Write explanatory notes on the following

    (i)   Digital number.   (2.5 marks)

    (ii)   Spatial resolution.   (2.5 marks)

    (iii)   Radiometric resolution.   (2.5 marks)

    (iv)   Spectral resolution.   (2.5 marks)

    (v)   Temporal resolution.   (2 .5 marks)

    (vi)   Hard classifiers.   (2.5 marks)

    (vii)   Soft classifiers.   (2.5 marks)

    (viii) Spatial filters.   (2.5 marks)

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