

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE**

**SOIL 213: SOIL GENESIS AND CLASSIFICATION**

**STREAMS: B.SC AGRIC Y2S2**

**TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 08/04/2020**

**11.30 A.M. – 1.30 P.M.**

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**INSTRUCTIONS:**

- Answer ALL questions in section A (30 marks) any two in section B (40 marks).

**SECTION A (30 MARKS): ANSWER ALL QUESTIONS**

**QUESTION ONE**

- (a) Explain the A horizons of a typical soil profile. (3 marks)
- (b) Explain the class IV soils in the USDA Land Capability Classification System. (5 marks)

**QUESTION TWO**

- (a) Explain the hierarchy of subgroups in the soil taxonomy. (3 marks)
- (b) Distinguish between aquic and xeric soil moisture regimes. (2 marks)

**QUESTION THREE**

- (a) Explain the soil consistence classes under moist soil status. (6 marks)
- (b) Explain polypedon and soil association as soil mapping units. (4 marks)

**QUESTION FOUR**

- (a) Explain the purposes of legend development and documentation. (3 marks)

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- (b) Explain how bright light and gray, bluish-green soil colors are associated with soil attributes. (4 marks)

**SECTION B (40 MARKS): ANSWER TWO QUESTIONS**

**QUESTION FIVE**

- (a) Describe the soil structure according to the grade of particles of a given soil. (4 marks)
- (b) Discuss the limitations for mechanization of land for agricultural productivity. (10 marks)
- (c) Describe Histosols and Entisols soil orders. (6 marks)

**QUESTION SIX**

- (a) Discuss soil mineralogical data and the purposes for which they may be required during soil survey. (8 marks)
- (b) Discuss the umbric and melanic epipedons as diagnostic surface horizons of mineral soils. (4 marks)
- (c) Illustrate the structure of the suitability classification of soils and land for agricultural purposes. (8 marks)

**QUESTION SEVEN**

- (a) Explain grind sampling as a common soil sampling design. (6 marks)
- (b) Explain the guidelines used to determine the particle class of an ideal soil. (6 marks)
- (c) Explain the requirements for albic and kandic diagnostic subsurface horizons of a typical soil horizon. (8 marks)
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