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University Examinations 2013/2014

THIRD YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF

BACHELOR OF SCIENCE IN HORTICULTURE

AHS 2311 – SOIL FERTILITY AND FERTILIZERS

DATE: DECEMBER 2013

TIME: 2HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE – 30 MARKS

- (a) What is soil fertility? (2Marks)
- (b) Explain how Cation Exchange Capacity (CEC) of the soil affects the soil fertility. (5marks)
- (c) Explain mineralization and Ammonification transformations of Nitrogen-mineralization in the soil. (7Marks)
- (d) Describe the phosphorous (p) fixation process. (5Marks)
- (e) Explain the factors that affect Potassium availability. (6Marks)
- (f) Explain the various methods of fertilizers placement. (5marks)

QUESTION TWO – 20MARKS

- (a) Explain how moisture and temperature are factors of soil fertility. (6Marks)
- (b) Explain the benefits of using organic manure in sustainable agriculture. (14Marks)

QUESTION THREE – 20 MARKS

- (a) Explain the characteristics features that make urea ($\text{Co}(\text{NH}_2)_2$) most widely used N-source of all Nitrogen fertilizers. (10Marks)
- (b) What are the various sources of (K) Potassium in the soil. (10Marks)

QUESTION FOUR – 20MARKS

- (a) Explain the characteristics of phosphatic fertilizers. (5Marks)
- (b) What is HN_4^+ fixation and under what kind of soil conditions does it occur? (10Marks)
- (c) Highlight five (5) commercial inorganic nitrogenous fertilizers. (5Marks)

QUESTION FIVE – 20 MARKS

- (a) Discuss the volatilization of Ammonia (NH_3) in the soil. (8Marks)
- (b) (i) Calculate the amount of the following fertilizer carriers required to prepare two (2) tones of a mixed fertilizer of grade 10-5-5.

The carriers are:

Ammonium Sulphate 20-0-0

Superphosphate 0-2-0

Potassium Nitrate 13-0-41

- (ii) Calculate the amount of filler materials. (12Marks)