



Uva Wellassa University
Faculty of Animal Science & Export Agriculture



BSc in Export Agriculture

End Semester Examination – March/ April 2013
Year II Semester I

Land Reclamation Engineering (EAG 246-0)

Instructions

Answer all questions

No. of questions : Essay Questions (02)

No. of pages : Two (02)

Time : 45 minutes

Total marks allocated : 80%

Index No:

Part II - Essay

Question 01

Giving appropriate examples, describe how mismanagement of land affects on soil degradation.

(30 marks)

Question 02

D) 100g of soil contains 10 meq of Mg^{2+} , 4 meq of Na^+ , 3 meq of NH_4^+ , 0.5 meq of Ca^{2+} , 1 meq of Al^{3+} & 1.5 meq of K^+ .

Calculate;

- Cation exchange capacity of soil
- Base saturation percentage of soil
- Exchangeable sodium percentage of soil
- What is the gypsum requirement of soil, if the Permissible $[Na^+]$ is 5%, depth and bulk density of soil are 50 cm and $1.5 g/cm^3$ respectively?

(25 marks)

II) A blend of 70% canal water & 30% tube well water is mixed for irrigation. The electrical conductivity of the canal water & tube well water are 0.4 mmhos/cm & 4.0 mmhos/cm respectively. Saturation percentage of the soil which is going to be irrigated is 40%, bulk density is 1.25g/cm^3 and the root zone depth is 30 cm.

- Calculate the resulting electrical conductivity of the mixed water used for irrigation.
- Determine the depth of this irrigation water which would change this soil in to saline condition.
- If this soil is then going to reclaim, calculate the amount of water required to saturate this soil
- If the permissible salt concentration is 4 mmhos/cm, Electrical Conductivity of the soil is 8 mmhos/cm and the leaching coefficient is 1.23, calculate the water requirement to leach the excess salts from this soil.

(25 marks)

Use the following equations when necessary

$$M = 10^4 \log \left(\frac{S_i}{S_o} \right)^\alpha$$

$$\Delta EC_i = \frac{D_i}{D_s} \cdot \frac{dw}{ds} \cdot \frac{EC_i}{Sp} \cdot 100$$

$$G = 0.086 (S - 0.05T) dh$$