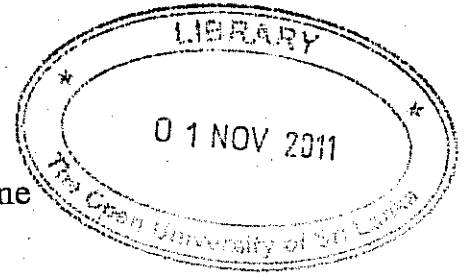




The Open University of Sri Lanka  
 Faculty of Engineering Technology  
 Bachelor of Industrial Studies Programme  
 Final Examination-2010/2011



**AEI 6234 Environmental Controls in Farm Structures**

Date : 30.03.2011  
 Time : 1400-1700  
 Duration : Three (03) hour.

Answer four questions including question no 1.

1. a) Briefly discuss the effect of density difference and viscosity on thermal convection.
- b) A horizontal heating pipe carries hot water and release heat in to the green house air by convective heat transfer. The outside diameter of the pipe is 50mm and its surface temperature is 90° C. The green house air temperature is 20 ° C. Assume that the air flow is with in the laminar region. Calculate the followings.
  - i) Convective heat transfer coefficient
  - ii) Rate of heat loss
2. Write short notes on following topics.
  - a) Types of foundations
  - b) Psychometric chart
  - c) Reinforced concrete
  - d) Green house structures
  - e) Enhanced green house effect
3. a) Briefly explain the effect of moisture and temperature on safe storage of grains.
- b) Write a brief account on different grain storage structures (both traditional and modern) use in Sri Lanka for paddy storage.
4. Assume that you have appointed as a consultant to advice a farmer in Kurunegala area to establish a new farm in 10 Ac of land. He decides to have a poultry unit, cattle house (including 30 cattle) a piggery and vegetable cultivation surrounding the farm area. Further he decides to have a sales outlet. Write an essay on how could you guide him to maximize his profit while efficient use of available space.

5.a) You have given a piece of wood which density is unknown. Before recommend this as a building material you should know its density. Clearly write down a simple method to find its density.

b) Write a short essay on different physical characteristics to be considered in choosing wood as a construction material. (Answer this question using at least four factors)

6. a) What are the three major types of loads act on any type of agricultural building. Discuss them.

b) You have decided to construct a large scale cattle house in Muthurajawela area. What sort of factors to be considered before constructing? Write an essay on that.