Uva Wellassa University
Faculty of Animal Science & Export Agriculture
Bachelor of Animal Science
B.Sc. in Export Agriculture

End Semester Examination –Sep/Oct 2013
Year 1 Semester II

Fundamentals of Agricultural, Food & Biochemical Engineering (AAS 102 – 3/0)

Instructions
Answer **all** questions
No. of questions : Three (03)
No. of pages : Two (02)
Time : One hour
Total marks allocated : 30/100

Index No:
.....

PART III - Essay

Question 01

I. Write short notes on,

a) Overall Heat Transfer Co-efficient (05 marks)

b) Laws of Thermodynamics (05 marks)

c) Rule of flow continuity (05 marks)

d) Energy of flowing fluids (05 marks)

II. Milk is flowing into a pipe cooler having 0.7 m internal diameter at a rate of $8 kgs^{-1}$.The initial temperature of milk is 55°C and it is wished to cool to 10°C by circulating 5°C water around the pipe. Calculate the **length** of pipe cooler.

(Assume an overall coefficient of heat transfer from the cooler pipe to the milk is 900 J m^{-2} s^{-1} $°C^{-1}$, and that the specific heat of milk is 3900 J kg^{-1} $°C^{-1}$)

(20 marks)

15

Question 02

I. **"Aeration and agitation are implemented in most fermentation processes".**
Comment on this statement. (10 marks)

II. How does the **Reynolds number (Re)** is applied to characterize the behaviour of flow **in agitation**? (10 marks)

III. Briefly discuss the factors considered in designing & operation of a bioreactor. (10 marks)

IV. Briefly explain the importance of dissolved oxygen (DO) level in a bioreactor. (10 marks)

Question 03

I. What are the **general assumptions** we make, when analyzing trusses? (05 marks)

II. What do you mean by a **Free Body Diagram**? (05 marks)

III. Given below is a roof truss which is in equilibrium. Calculate,

a. The $\mathbf{R_1}$ & $\mathbf{R_2}$ reactions. (05 marks)

b. The **internal member forces.** (25 marks)