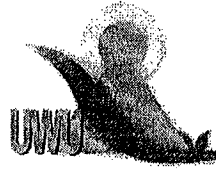


**Uva Wellassa University
Faculty of Animal Science & Export Agriculture**

**Bachelor of Animal Science & B.Sc. in Export Agriculture
Degree Programmes**



**Uva Wellassa
University**

**End Semester Examination – August 2010
Year I Semester II**

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

PART II - Essay



Question 01

- I. Write short notes on,
- a) Heat Transfer (05 marks)
 - b) Internal Energy (05 marks)
 - c) Specific Heat Capacity (05 marks)
 - d) Laminar flow & Turbulent flow (05 marks)
 - e) Bernoulli's Theory (05 marks)

- II. Milk is flowing into a pipe cooler having 1.4 m internal diameter at a rate of 4kg s^{-1} . The initial temperature of milk is 60°C and it is wished to cool to 15°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 of $900\text{ J m}^{-2}\text{ s}^{-1}\text{ }^\circ\text{C}^{-1}$, and that the specific heat of milk is $3900\text{ J kg}^{-1}\text{ }^\circ\text{C}^{-1}$)

(15marks)

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 in equilibrium. Calculate,
 - a. The R_1 & R_2 reactions. (05 marks)
 - b. The **internal member forces**. (25 marks)

