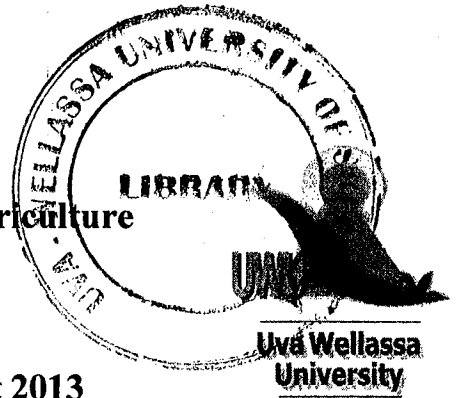


Uva Wellassa University
Faculty of Animal Science & Export Agriculture
Bachelor of Animal Science
B.Sc. in Export Agriculture



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:

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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 kg s^{-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 $900 \text{ J m}^{-2} \text{ s}^{-1} \text{ }^\circ\text{C}^{-1}$, and that the specific heat of milk is $3900 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$)

(20 marks)

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 R_1 & R_2 reactions. (05 marks)
 - b. The **internal member forces**. (25 marks)

