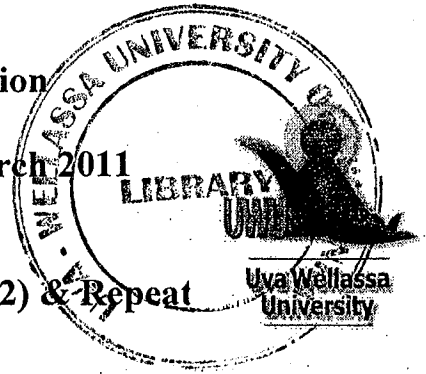


**Uva Wellassa University  
BSc in Tea Technology & Value Addition**

**End Semester Examination – February/March 2011  
Year II Semester I**



**Fundamentals of Biochemical Engineering (TEA 221-2) & Repeat  
Multiple Choice Questions**

**Instructions**

Answer all questions

No. of questions : Fifteen (15)

No. of pages : Four (04)

Time : 30 minutes

Total marks allocated : 30%

Index No:

.....

NO

## PART II

### Question 01

I. Write short notes on:

a) Critical Reynold's Number

(07 marks)

b) Overall Heat Transfer Coefficient of a heat exchanger

(08 marks)

II. In a counter flow heat exchanger, water is being chilled by using brine. If the rate of flow of the brine is  $2 \text{ kg s}^{-1}$  and that of the water is  $1.5 \text{ kg s}^{-1}$ .

Assuming that there is no any gains or losses of energy in the system, estimate the temperature to which the water is cooled if the brine enters at  $-8^\circ\text{C}$  and leaves at  $10^\circ\text{C}$ , and if the water enters the exchanger at  $32^\circ\text{C}$ .

(Take the specific heats to be  $3.38$  and  $4.18 \text{ kJ kg}^{-1} \text{ }^\circ\text{C}^{-1}$  for the brine and the water respectively.)

(10 marks)

### Question 02

I. Briefly explain the significance of Aeration and agitation processes implemented in most bioreactors.

(07 marks)

II. How does the behavior of flow during agitation process characterize with the Reynold's Number.

(08 marks)

III. Briefly discuss the factors considered in designing & operation of a bioreactor.

(10 marks)

