



**Uva Wellassa University**  
**Faculty of Animal Science & Export Agriculture**  
**BSc in Tea Technology & Value Addition**



**End Semester Examination – February/March 2012**  
**Year II Semester I**

**Fundamentals of Biochemical Engineering (TEA 221-2)**

---

**Instructions**

**Question 01**

I. Write short notes on:

- a) Dynamic viscosity (10 marks)
- b) Critical Reynold's Number (10 marks)

II. A dryer is used to dry 450 kg of fermented tea from 50% moisture to 10% moisture.

Estimate;

- a) Amount of water removed during drying (05 marks)
- b) Heat requirement of the dryer if the latent heat of evaporation is 2257kJ/kg. (05 marks)

**Question 02**

I. Briefly discuss the main functions of a properly designed bioreactor. (15 marks)

II. A bacterial fermentation was carried out in a reactor containing broth with average density of  $1200 \text{ kg/m}^3$  and viscosity  $0.02 \text{Ns/m}^2$ . The broth was agitated at 90 rpm and the impeller diameter ( $D_i$ ) is 2m.

- a) Calculate the Reynolds number. (10 marks)
- b) Determine the agitator power ( P )in Watts , if the power number for turbulent regime is considered as 6 & 4 for laminar flow at certain conditions. (05 marks)