

BSc in Export Agriculture
Third Year Second Semester Examination – December/January 2017/18

Food Engineering (EAG 345 - 2)
Section III – Essay Questions

Instructions:

Answer all questions in the given booklet.

No. of questions : Two (02)

No. of pages : Two (02)

Time : One (01) hour

Total marks allocated : 50%

01.

I.

- a) What is energy balance? (10 marks)
- b) Briefly explain four (04) importance of conducting energy and material balance in food processing? (10 marks)
- c) Give two (02) reasons why energy balance is complicated and difficult compare to Mass balance. (10 marks)

II.

A tunnel blancher is designed to process 5000 kg/h of cut broccoli using steam at atmospheric pressure. The temperature of the entering steam is 100 °C and leaving the blancher as liquid is also 100 °C.

Input temperature of broccoli = 15 °C

Output temperature of broccoli = 100 °C

Specific heat of broccoli (c_p) = 3.8 kJ/kg°C

Assume 100% efficiency for theoretical calculation

- a) Construct a process flow diagram for the blanching process. (20 marks)
- b) Calculate the amount of heat absorbed by the broccoli. (10 marks)
- c) Write the all possible energy balance equations for above mentioned process. (20 marks)
- d) Calculate the required steam flow rate for the blanching process. (10 marks)
- e) If the efficiency of the blancher is 30% calculate the required steam flow rate.(10 marks)

02.

- I. You are requested to design a grinding machine for paddy. What are the physical parameters of paddy you would select for the testing and describe how you will handle those parameters in your design? (50 marks)
- II. Briefly explain the extrusion process of an extruder with the labeled diagram. (50 marks)

[End of section III]