Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
300 level 1st Semester Examination – Jun. / Jul. 2017
SCT 363-2 Food Process Engineering (Repeat)

Uva Wellassa University

Instructions to candidates

Duration: 02 hour

Number of questions: Four (04)

Mark allocation: 100

Answer all questions

1. Write the overall energy balance equation for a system between inlet and exist. Define all the notations you have used. (25 marks)

2. Step by step deduce a fomula for orverall heat transfer coefficient in a double pipe heat exhanger with usual notation (Note that hardness of water in the area is also high). (25 marks)

3. Define the terms given below and use a diagram to illustrate them.
   I. Velocity boundary layer.
   II. Boundary layer region.
   III. Hydrodynamic entrance region.
   IV. Hydrodynamically developing flow.
   V. Hydrodynamically fully developed region.

(25 marks)

4. The wall of an oven consists of two metal sheets with insulation in between. The temperature of the inner wall surface is 200°C and that of the outer surface is 50°C. The thickness of each metal sheet is 2 mm, the thickness of the insulation is 5 cm, and the thermal conductivity is 16 W/m°C and 0.055 W/m°C respectively. Calculate the total resistance of the wall to heat transfer and the heat transfer losses through the wall per m^2 of wall area.

(25 marks)

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