UNIVERSITY OF GHANA

BSC. ENGINEERING SECOND SEMESTER EXAMINATIONS: 2015/2016

SCHOOL OF ENGINEERING SCIENCES

FPEN 314: RHEOLOGICAL AND SENSORY PROPERTIES OF FOODS (2 Credits)

INSTRUCTIONS: ANSWER TWO QUESTIONS FROM EACH SECTION

TIME ALLOWED: TWO (2) HOURS

SECTION A

1.

a. Non-Newtonian fluids are frequently characterized using the power law and Herschel-Bulkley models. Using these models, and with food product examples, write brief comments on

   i. Plastic flow

   ii. Pseudoplastic flow

   iii. Dilatant fluids

b. Explain the molecular basis of their differences and indicate why these classifications are important to the Food Process Engineer.

2.

a. Describe the time and temperature dependency of fluid viscosity, and indicate how these are major considerations in modelling the viscosity of fluids.

b. Describe how you will improvise and validate a rapid viscosity measuring equipment for a palm soup base product.

3. Many semi-solid foods can be described as having visco-elastic behaviour. Using either transient (i.e. creep, or stress-relaxation) or dynamic experiments, describe how the viscous and plastic components of a viscoelastic food may be determined.

SECTION B

4.

a. Discuss any five of the physiological and cultural factors which can influence sensory measurements. For each factor indicate the control measure that can be used to minimise associated errors.

b. Indicate the situations under which sensory tests can be applied in a food processing facility.

c. List the five basic taste sensations and a corresponding compound that can produce that sensation.

5.

a. Your company is considering making a significant modification in the process for its mango juice product. The new process could have an impact on the appearance (colour) of the product. You have been asked to conduct sensory evaluation to investigate if there is any impact. You have all the resources and facilities available to conduct any sensory evaluation test of your choice.

i. Select a method for sensory evaluation and explain your choice.

ii. Describe in detail how you would conduct the test.

b. Differentiate between acceptance and preference testing.

6.

a. Sensory acceptance tests can be classified into three types based on test location. Briefly describe the key characteristics of any two types.

b. Explain how you would conduct **either** a paired preference **or** ranking test for a sample of biscuits to assess consumers' preference.

c. What are the differences between appearance and texture of a food product?