UNIVERSITY OF GHANA

BSC. ENGINEERING SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS: 2020/2021

DEPARTMENT OF FOOD PROCESS ENGINEERING

FPEN 308: ENVIRONMENTAL ENGINEERING IN FOOD PROCESSING (3 Credits)

INSTRUCTIONS: ***ANSWER ANY TWO QUESTIONS***

TIME ALLOWED: ONE AND A HALF (1½) HOURS

1.

a. With the aid of a diagram show the components and activities involved in solid waste management.

b. State the different ways in which solid waste in the food industry could be avoided or minimized.

c. A pineapple juice factory generates 7250 kg of solid waste per month. The factory has a staff population of 350 people. Each staff produces 40 kg of solid waste per month.

   i. Estimate the amount of solid waste generated per year at the factory and by the total staff.

   ii. If X% of the total solid waste generated in a year is reused, followed by a diversion of 3X% of the solid waste for composting before sending the rest to the landfill site. Determine X% if the landfill site is 148 m^3. Assume the density of the solid waste is 400kg/m^3.

2.

a. The raw wastewater from a brewery factory is discharged into a municipal wastewater treatment plant for processing with domestic wastewater. The characteristics of both the brewery factory and domestic wastewater are given in Table 1 below: