CHUKA  **UNIVERSITY**

RESIT/SPECIAL EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF

FOST 335: UNIT OPERATIONS IN FOOD PROCESSING

STREAMS: **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 03/02/2021 **11.30 A.M – 1.30 P.M**

INSTRUCTIONS:

ANSWER ALL QUESTIONS

a) Define the term unit operation as used in food processing (5 Marks)

b) Give five classes of unit operation based on the property transferred (5 Marks)

c)Highlight five properties that must be considered in selecting materials to be used in the construction of food contact surfaces (5 Marks)

1 With the help of a sketch diagram describe how continuous milk pasteurisation is achieved under the following considerations: Heat exchanger; regenerative heating and cooling; holding section and flow diversion (8 marks)

2 Using a sketch diagram(s) explain the working principles of a typical spray drier. Consider the design of the various essential components (12 marks)

3 a) With help of a sketch diagram describe briefly how the centrifugal cream separator works (6 marks)

b) 35,000 kg of whole milk containing 4% fat is to be separated in a 6 hour period into skim milk with 0.45% fat and cream with 45% fat. Calculate the flow rates of the two output streams from a continuous centrifuge which accomplishes this separation. Assume that the process is in a steady state, and that is flows and quantities held up in

vessels do not change with time (4 marks).

4 Distinguish between batch and continuous operations in food processing, giving advantages and disadvantages of each (10 Marks)

5 With aid of illustrations, discuss three types of process tanks (15 Marks)
