TECHNICAL UNIVERSITY OF MOMBASA

BACHELOR OF SCIENCE IN FOOD TECHNOLOGY & QUALITY ASSURANCE

AFS 4208: FOOD ENGINEERING I

EXAMINATION INSTRUCTIONS:

This paper contains **TWO** sections, A and B. Answer **ALL Questions in Section A**, and **ANY TWO** from Section B.

You should have the following during this examination:

- Scientific Calculator

Section A:

Question One

(a) Explain the role of a Food Engineer and the scope of food process engineering in a food processing industry **(5 Marks)**

(b) Write short notes on "***Belt Tension"*** in relation to conveyors **(4 Marks)**

(c) With an aid of a labeled diagram explain how "*aspiration cleaning (winnowing)"* can be achieved in food processing set up handling cereals **(6 Marks)**

(d) State **FIVE** characteristics of shrouded turbines **(5 Marks)**

e) Write short notes on mixing tank design and impeller mountings (10 Marks)

SECTION B (Answer ANY TWO questions from this Section)

Question Two

With an aid of a clear labeled diagram(s) discuss the mode of operation of a Tumbling mill **(20 Marks)**

Question Three

(a) Sugar is ground from crystals of which it is acceptable that 80% pass a 500 µm sieve (US Standard Sieve No.35), down to a size in which it is acceptable that 80% passes a 88 µm (No.170) sieve, and a 5-horsepower motor is found just sufficient for the required throughput. If the requirements are changed such that the grinding is only down to 80% through a 125 µm (No.120) sieve but the throughput is to be increased by 50% would the existing motor have sufficient power to operate the grinder? Assume Bond's equation. **(10 Marks)**

(b) Discuss the storage of meat, fish and poultry **(10 Marks)**

Question Four

Discuss mixing under the following headings:

(a) Single –phase liquid mixing (**4 Marks)**
(b) Mixing of immiscible liquids **(5 Marks)**
(c) Gas-liquid mixing **(3 Marks)**
(d) Liquid – solid mixing **(3 Marks)**
(e) Gas - liquid - solid mixing **(2 Marks)**
(f) Solid – solid mixing **(3 Marks)**

Question Five

With the aid of a clear labeled diagram discuss the operation of a colloid mill (20 marks)