



(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

THIRD YEAR EXAMINATIONS
FOR THE DEGREE
OF

BSC. FOOD SCIENCE AND TECHNOLOGY

MAIN EXAMINATIONS

COURSE CODE: APT 310

COURSE TITLE: DESIGN OF FOOD PROCESSING UNITS AND MACHINERY

DATE: 25TH APRIL 2023

TIME: 8-10 AM

Instruction to candidates

- This paper contains SIX questions
- Answer any FIVE questions

MMUST observes ZERO tolerance to Examination Cheating

This paper consists 3 pages Please turnover



QUESTION ONE

- a) Define the terminology *design constraints* of plant design. (1 Mark)
- b) Outline the broad functions of plant design. (3 Marks)
- c) Discuss briefly the principles of equipment design for *Ready-to-Eat* processing operations. (10 Marks)

QUESTION TWO

Discuss in details the factors that affect the quality of horticultural produce during transportation and the corresponding mitigation measures. (14 Marks)

QUESTION THREE

Discuss in details what should be covered in the technical analysis report of feasibility studies of plant design. (14 Marks)

QUESTION FOUR

- a) Outline the general designs of belt conveyors (2 Marks)
- b) Discuss the design of a belt conveyor with a specific capacity for transportation of grains. (3 Marks)
- c) A belt conveyor is moving maize over the end pulley. The belt speed is 5 m/sec. The required power for the operation is 3Kw. Determine the effective belt tension. (2 Marks)
- d) Discuss in details the application of idlers in conveyance of materials using conveyor belts. (4 Marks)
- e) State the factors that influence the capacity of screw conveyors. (3 Marks)

QUESTION FIVE

- a) Discuss in details the objectives of plant layout. (4 Marks)
- b) Discuss the five key considerations when designing a food processing plant. (10 Marks)

QUESTION SIX

Discuss in details the five key steps in the design thinking process. (14 Marks)