



UNIVERSITY OF ESWATINI  
Faculty of Health Sciences  
Department of Environmental Health Science

DEGREE IN ENVIRONMENTAL HEALTH AND FOOD  
SCIENCE

**RE - SIT EXAMINATION PAPER 2020**

TITLE OF PAPER : FOOD CHEMISTRY  
COURSE CODE : EHS 321  
DURATION : 2 HOURS  
MARKS : 100

INSTRUCTIONS : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY  
: ANSWER **ANY FOUR** QUESTIONS.  
: EACH QUESTION **CARRIES 25** MARKS.  
: WRITE NEATLY & CLEARLY  
:  
: BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

**DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.**

### QUESTION ONE

- (a) Starch is normally isolated from different raw materials (corn, wheat, potatoes,...). It is then modified in different ways. Briefly elaborate the different stages that are involved in starch modification. [20 Marks]
- (b) How does Strecker degradation differ from Caramellisation reaction?[5 Marks]
- Total [25 Marks]**

### QUESTION TWO

- (a) Define water activity and explain how this concept is utilized in food preservation. [12 marks]
- (b) Discuss van der Waals Attraction forces as an aspect of colloidal interactions. [6 Marks]
- (c) Which of the following listed types of reactions in food are examples of non-enzymatic browning and which ones are examples of enzymatic browning?
- (i) Maillard
  - (ii) Caramelization
  - (iii) Ascorbic acid oxidation
  - (iv) Phenolase [4 Marks]
- (d) Differentiate between myofibrils, sarcoplasm and stroma proteins [3 Marks]
- Total [25 Marks]**

### QUESTION THREE

- (a) Discuss the general causes of vitamin losses in during food processing and suggest how this trend can be reduced. [25 marks]

### QUESTION FOUR

- (a) The naming of fatty acids can be explained from a nutritionist point of view or functional point of view. Discuss the differences in the approach as a way of naming fatty acids. [10 marks]
- (b) What is the difference between *cis* and *trans* fatty acids? [5 Marks]
- (c) Define an emulsion and describe the different forms of emulsions that are commonly encountered in food industry. [10 Marks]
- Total [25 Marks]**

### QUESTION FIVE

Write short notes on any five (5) of the following;

- (i) Steric Repulsion theory [5 Marks]
  - (ii) Stabilizers and thickeners [5 Marks]
  - (iii) Bleaching as a form of refining lipids [5 Marks]
  - (iv) Initiation stage during chemical oxidation of lipids [5 Marks]
  - (v) Decarboxylation of proteins [5 Marks]
  - (vi) Oleic – Linoleic acids [5 Marks]
  - (vii) Colloidal solution [5 Marks]
- Total [25 Marks]**