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

BSc IN ENVIRONMENTAL HEALTH SCIENCE
MAIN EXAMINATION PAPER 2019

TITLE OF PAPER:	**SENSORY EVALUATION**
COURSE CODE:	EHS425
DURATION:	2 HOURS
MARKS:	100
INSTRUCTIONS:	READ THE QUESTIONS AND INSTRUCTIONS CAREFULLY

ANSWER **QUESTION ONE** AND **ANY OTHER THREE** QUESTIONS

EACH QUESTION **CARRIES 25 MARKS**

BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER

WRITE NEATLY AND CLEARLY

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

QUESTION ONE
1. List the five <u>main sensory perceptions</u> and provide at least one example for each.
(5 Marks)
2. Besides the five sensory perceptions, discuss the other <u>factors that influence food choices?</u>
(6 Marks)
3. Define the term "sensory threshold" and discuss the three types of sensory threshold (Recognition, absolute and difference threshold).
(8 Marks)
4. Define the following terms:
(4 Marks)
   4.1 β-risk
   4.2 α-risk
5. In a Two-out-of-Five Test, what is the probability of guessing a correct answer?
(2 Marks)
(25 Total Marks)

QUESTION TWO
1. In a Duo-trio test when do you reject the assumption of "no difference"? (3 Marks)
2. What is the chance of guessing a correct result in a Duo-trio test? (2 Marks)
3. Define and briefly discuss the following words/acronyms in relation to sensory evaluation.
(20 Marks)
   3.1 BIBD
   3.2 Directional Paired Comparison Test
   3.3 CBD
   3.4 Flavour Profile Method
(25 Total Marks)

QUESTION THREE
1. In an attempt to modernize a condiment plant a manufacturer must replace an old cooker used to process barbecue sauce. The plant manager would like to know if the product produced in the new cooker tastes the same as that made in the old cooker as claimed by the supplier. A total of 60 responses, 30 matched and 30 unmatched pairs, are collected from 60 subjects. Each subject evaluates either a matched pair (A/A or B/B) or an unmatched pair (A/B or B/A) in a single session

The results analysis is shown below:

SUBJECTS RECEIVED			
	MATCHED PAIR AA or BB	UNMATCHED PAIR AB or BA	TOTAL
SUBJECTS SAID:			
SAME	17	9	26
DIFFERENT	13	21	34
TOTAL	30	30	60

The x^2 –Analysis is used to compare the placebo effect (17/13) with the treatment effect (9/21).

$$x^2 = \Sigma\frac{(O-E)2}{E} + \Sigma\frac{(O-E)2}{E} + \Sigma\frac{(O-E)2}{E} + \Sigma\frac{(O-E)2}{E}$$

Where;
   0 = Observed number and

E = Expected number, in each of the four boxes (same/Matched, same/unmatched, Different/matched, and different/unmatched

- E = (26 x 30)/60 = 13,
- E = (34 x 30)/60 = 17

$$x^2 = \sum \frac{(17-13)2}{13} + \sum \frac{(9-13)2}{13} + \sum \frac{(13-17)2}{17} + \sum \frac{(21-17)2}{17} = 4.34$$

- Degree of freedom (df) =1; p=0.05; x^2=3.84 **(on the Upper-α Probability Points of x^2- distribution table)**

1.1 What is the project objective? (2 Marks)
1.2 What is the test objective? (2 Marks)
1.3 What is the name of this Overall Difference Test? (2 Marks)
1.4 What is your interpretation of the results? (3 Marks)
1.5 As a Sensory Analyst employed by the condiment plant, how would you advise the Plant Manager regarding his intention to replace the old barbecue sauce cooker with a new One? (2 Marks)
1.6 The Plant Manager informs you that the substitution of the new cooker remains an important cost/efficiency item in the plant. What would you advise the Plant Manager to do in order to determine whether the barbecue sauce processed in the new cooker would do well in the market? (3 Marks)

2. You are a sensory analyst at the Eswatini Beverages. The Factory Manager is brewing a test beer "B" using a new lot of malt and you are required to determine if it can be distinguished from control beer "A" taken from current production. You decide to accept a 5% risk of error. 12 trained assessors are available for the test. You prepare 18 glasses of "A" and 18 glasses of "B" to make 12 sets that are distributed at random among the panellists, using two each of the combinations ABB, BAA, AAB, BBA, ABA, and BAB. 8 subjects correctly identify the odd sample. From the Critical Number of Correct Responses table the tabled value is 8 (equal to the number of correct responses).
   2.1 What is the name of this test? (2 Marks)
   2.2 What is your interpretation of the results? (2 Marks)
   2.3 What would you advise the Factory Manager to do following your conclusion of the results? (5 Marks)
   3. One good sample presented in a group of poor samples during a sensory test will tend to be rated lower than if presented on its own. This is an example of the contrast effect in the order of presentation of samples during a sensory test? **True/False?** (2 Marks)

(25 Total Marks)

QUESTION FOUR
1. Psychological factors can influence a judge's response when evaluating food products. List and describe <u>three (3)</u> of these factors and indicate how you can reduce their effect when conducting sensory tests. (15 Marks)

2. Name the three directional discrimination/difference tests (3 Marks)

3. At least five types of bias may be caused by the order of presentation of samples to panellists in a sensory study. List these <u>five</u> (5) types of bias. (5 Marks)

4. *How can the order of presentation effects be minimized?* *(2 Marks)*

(25 Total Marks)

QUESTION FIVE

1. Explain the concept of adaptation to a stimulus by cross-adaptation and cross-potentiation and give a specific example. (8 Marks)
2. Describe briefly two (2) of the following sensory tests. (10 Marks)
   i) Triangle Test
   ii) Duo-trio Test
   iii) Two-out-of-five Test
   iv) Same/Different Test/Simple Difference Test

3. Physiological factors can influence a judge's response when evaluating food products. Explain the concept of enhancement/facilitation to stimuli presented simultaneously as a mixture by enhancement, synergy or suppression. (6 Marks)

4. A sample that follows a particularly poor one will tend to be rated higher. This is an example of the contrast effect in the order of presentation of samples during a sensory test? **True/False** (1 Marks)

(25 Total Marks)