



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

BSc IN ENVIRONMENTAL HEALTH SCIENCE  
MAIN EXAMINATION PAPER 2021  
**EXAM PAPER**

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. Psychological factors can influence a judge's response when evaluating food products. List and describe three (3) of these factors and indicate how you can reduce their effect when conducting sensory tests. [15 Marks]
2. Name 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 five types of bias. [5 Marks]
4. How can the order of presentation effects be minimized? [2 Marks]

**(25 Total Marks)**

### QUESTION TWO

1. Describe briefly four (4) of the following sensory tests. [20 Marks]
  - i) Triangle Test
  - ii) Duo-trio Test
  - iii) Two-out-of-five Test
  - iv) Same/Different Test/Simple Difference Test
  - v) "A"- "Not A" Test
  - vi) Difference-from-Control (DFC) Test
2. Briefly discuss Capriciousness vs. Timidity as a psychological factor that may influence sensory perception during sensory studies. [5 Marks]

**(25 Total Marks)**

### QUESTION THREE

1. Explain the concept of adaptation to a stimulus by cross-adaptation or cross-potentialiation and give a specific example. [9 Marks]
2. 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. [9 Marks]
3. List the five main sensory perceptions and provide at least one example for each. [5 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** [2 Marks]

**[25 Total Marks]**

### QUESTION FOUR

1. What is the difference between overall and attribute difference testing? Give a specific example of both including the formulation of the test hypothesis. [10 Marks]
2. Explain the concept of Trigeminal/Chemical Response. [5 Marks]
3. Define Type I and Type II errors in sensory evaluation. Give a specific example to illustrate your answer. What type of error can be more costly in an industrial context? Explain your answer. [10 Marks]

**[25 Total Marks]**

### QUESTION FIVE

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. 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 as shown in the table below:

The results analysis is shown below:

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

The  $\chi^2$  -Analysis is used to compare the placebo effect (17/13) with the treatment effect (9/21).

$$\chi^2 = \sum \frac{(O-E)^2}{E} = \sum \frac{(O-E)^2}{E} + \sum \frac{(O-E)^2}{E} + \sum \frac{(O-E)^2}{E} + \sum \frac{(O-E)^2}{E}$$

Where;

O = Observed number and

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

Different/matched, and different/unmatched

- $E = (26 \times 30)/60 = 13,$

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

- Degree of freedom (df) = 1;  $p=0.05$ ;  $\chi^2=3.84$  (on the Upper- $\alpha$  Probability Points of  $\chi^2$ - distribution table)

6.1 What is the project objective? [5 Marks]

6.2 What is the test objective? [3 Marks]

6.3 What is the name of this Overall Difference Test? [2 Marks]

6.4 What is your interpretation of the results? [5 Marks]

6.5 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? [5 Marks]

6.6 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? [5 Marks]

**[25 Total Marks]**