UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME	:	**BACHELOR OF SCIENCE IN FOOD SCIENCE, NUTRITION & TECHNOLOGY YEAR II & III (TR)**
COURSE CODE	:	**FSNT 202**
TITLE OF PAPER	:	**FOOD QUALITY ASSURANCE AND CONTROL**
TIME ALLOWED	:	**TWO (2) HOURS**
INSTRUCTIONS	:	**ANSWER QUESTION ONE (1) AND ANY OTHER (2) QUESTIONS**

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QUESTION 1 [COMPULSORY]

1. Define the terms Quality Control and Quality Assurance. (6)
2. Discuss the major differences and similarities between HACCP and GMP. (14)
3. What do you understand by certification as it refers to ISO 9001-2000? (10)
4. In what ways could SWASA benefit from Codex Alimentarius Commission and other international standards organizations in the development of national food standards? (10)

[TOTAL MARKS 40]

QUESTION 2

1. List the seven principles of HACCP (14)
2. What is a critical control point and how you would identify one? (10)
3. Biological hazards can cause more widespread injury to consumers than chemical hazards. Why is this likely to happen? (6)

[TOTAL MARKS 30]

QUESTION 3

1. Discuss the elements of the continuous improvement model in quality assurance and give examples of how people outside the organization can influence the product quality (15)
2. Discuss the importance of two international standards in food commodity/products trade. (15)

[TOTAL MARKS 30]

QUESTION 4

A manufacturer wanted to measure the capability of the filling machine by establishing the head space of bottled juice. He took a sample of 5 (five) juice bottles every one hour and measured the headspace in mm. He got the following data.

#1	#2	#3	#4	#5	$\overline{X}$	R
7	10	8	2	8		
6	9	3	4	3	5.0	
6	7	2	6	4		
4	8	5	7	7		
10	3	5	6	4		7
8	11	9	6	6		
5	7	5	6	7		
9	5	8	7	6		
6	5	4	5	5		
1	3	1	0	3		
3	4	6	5	4		
5	3	6	3	3		
5	6	8	9	7	7.0	
7	7	8	7	6		
7	7	6	7	7		
7	7	7	9	9		2
				Means	$\overline{\overline{X}}$ =	$\overline{R}$ =

Use the data in Table 1 and the factors given in Table 2 to answer the following questions and show your working

1. Fill up the missing figures in the table above (*You may answer this question on the question paper)* (12)
2. Calculate the upper and lower control limits (8)

3. If the target grand mean $(\overline{\overline{X}})$ and the upper and lower set limits were 5.9 mm, 7.5 mm and 3.5 mm respectively, what is the capability index? (8)
4. Can the packaging machine meet the targets? (2)

Table 2. Factors for Computing Control Chart Limits

Observations in each sample, *n*	**For Averages (x-bar)**	**For R chart**	
	A_2	**D_3**	**D_4**
2	1.880	0	3.267
3	1.023	0	2.575
4	0.729	0	2.282
5	0.577	0	2.115
6	0.483	0	2.004
7	0.419	0.076	1.924
8	0.373	0.136	1.864
9	0.337	0.184	1.816
10	0.308	0.223	1.777
11	0.285	0.256	1.744
12	0.266	0.284	1.716
13	0.249	0.308	1.692
14	0.235	0.329	1.671
15	0.223	0.348	1.652
16	0.212	0.364	1.636
17	0.203	0.379	1.621
18	0.194	0.392	1.608
19	0.187	0.404	1.596
20	0.180	0.414	1.586

[TOTAL MARKS = 30 Marks]