NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION: BACHELOR OF HUMAN NUTRITION	
QUALIFICATION CODE: 08BOHN	**LEVEL:** 8
COURSE CODE: NCA811S	**COURSE NAME:** Nutraceuticals and Alternative Nutritional Remedies
SESSION: JUNE 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

NONE

THIS EXAMINATION QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

SECTION A

QUESTION 1 **(10 MARKS)**

State whether the following statements are true or false and provide a reason for your choice. Each correct answer and reason are worth 2 marks.

1.1 A niacin (vitamin B3) deficiency may cause changes in the epigenetic regulation of gene expression. (2)

1.2 Based on their preparation, functional foods may be classified into 4 groups. (2)

1.3 The nutraceutical lycopene is mainly found in vegetables such as broccoli. (2)

1.4 Modified foods are different from medical foods. (2)

1.5 Microarray technology is one of the important emerging technologies in the science of nutrition. (2)

QUESTION 2 **(15 MARKS)**

2.1 Phytochemicals are chemicals exclusively produced by plants that have non-nutritional benefits to the body. Here are some of the important phytochemicals found in Namibian indigenous leafy vegetables: *Amaranthus ssp., Cleome* gynandra and *Hibiscus sabdariffa* and their potential effects. Please match each phytochemical with its correct effect. (4)

a. Steroids	1. Antifugal & antiviral activity
b. Flavonoids	2. Relationship with production of sexual hormones
c. Cardiac glycosids	3. Antimicrobial activities & antioxidant activity
d. Saponins	4. Inhibition of the sodium-potassium pump

2.2 If after having led an ethnobotanical field study among the Topnaar people, you obtain a low UV value (0,14) for the traditional medicinal plant *!Nara* (*Acanthosicyos horridus*) used to treat stomach aches, what does it indicate?
Select all the correct statement(s). (3)

a) Informants disagree over which plant to use to treat stomach aches.

b) !Nara is frequently used in the community to treat stomach aches.

c) Stomach ache is a disease category !Nara plant is reported to be used for.

d) !Nara is sparsely used in the community against stomach aches.

e) !Nara has a particular importance among the Topnaar people to treat gastrointestinal disorders.

2.3 In relation to the traditional African vegetables (TAV), which statements are correct? (2)

a) TAV are plants species that are indigenous to Africa.

b) Okra does not belong to the TAV because it is not only found in Namibia.

c) The mode of preparation of the TAV is deeply embedded in local cooking.

d) The African horned cucumber (Cucumis metuliferus) is a TAV used to treat stomach aches.

2.4 Complete the table below that relates to the San Community and give 3 diseases and related medicinal plants used among this community as well as the mode of administration of the medicinal plants. (6)

	Name of the plant (botanical or local name)	**Disease treated**	**Mode of administration**
1			
2			
3			

SECTION B

QUESTION 3 **(25 MARKS)**

3.1 When does the concept of generalised nutritional requirements become compromised? (1)

3.2 Mention two important epigenetic mechanisms that regulate gene expressions. (2)

3.3 Niacin (vitamin B3) is able to maintain the un-methylated state of CpG islands. What are the implications of having methylated CpGislands? (2)

3.4 Define the term "nutraceutical". (2)

3.5 Most nutraceuticals fall under two general categories. Mention these two categories. (2)

3.6 Define the term *"indigenous knowledge".* (3)

3.7 What is the nutritional value of *Amaranthus spp.* (for example *A. thunbergii* called *Ekwakwa)*? (2)

3.8 Cite the five (5) concepts that must be considered in establishing a Prior Informed Consent (PIC). (5)

3.9 What are the key areas in personalized nutrition (PN)? (2)

3.10 How can modern technology's potential in the field of personalized nutrition be realised? (4)

SECTION C

QUESTION 4 **(25 MARKS)**

4.1 Discuss how the acetylation and deacetylation of histones influences gene expression. (6)

4.2 Cardiovascular diseases are known to be a collection of multi-factorial disorders related to genetic and modifiable risk factors. Cardiovascular diseases (CVDs) continue to be the major cause of morbidity and mortality in the world and so our future

understanding of their homeostasis and pathogenesis is an important factor when considering therapy and prevention targets.

a) Mention any two intermediate risk phenotypes for CVD. (2)

b) Mention any two modifiable CVD risk factors. (2)

c) Mention any two non-modifiable CVD risk factors. (2)

4.3 Differentiate between traditional and non-traditional nutraceuticals and give one example of each. (1) (4)

4.4 Explain two (2) advantages, two (2) health and nutritive benefits as well as one challenge of resorting to indigenous leafy vegetables in the context of food security. (1) (5)

4.5 Evaluate the potential of nanotechnology in nutrition research. (4)

QUESTION 5 **(25 MARKS)**

5.1 State any two (2) reasons why there is a growing interest in Nutraceuticals and Functional foods. (2)

5.2 In the case of positive selection, what would be the signs that genes are subjected to positive selection? (4)

5.3 What is the main objective of cardiovascular risk modification and how can that objective be achieved? (4)

5.4 Outline any four (4) modes of herbal remedies utilisation (4)

5.5 Name and describe the four (4) types of functional foods. (8)

5.6 What is a nutritional biomarker? (3)

All the best!!!!