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DMI-ST. EUGENE UNIVERSITY

ZAMBIA

DEGREE EXAMINATION – DECEMBER 2024

Semester: VI 357FP63 NUTRITION ASSESSMENT AND NUTRIGENOMICS

Time: 3:00 Hours

Max. Marks: 100

Answer any FIVE Questions (5 x 20 = 100 Marks)

1. a) Establish a relationship between, nutrition survey, surveillance and nutrition interventions.
(5 Marks)
- b) With the application of nutrition assessment approaches, identify and explain nutrition assessment methods that could be used in the assessment of each of the processes listed above. (5 Marks)
- c) Discuss the significance of nutrition assessment in humans. (10 Marks)
2. a) International Organizations and agencies are important in promoting nutrition in the population. Explain the role of the United Nations Systems in Zambia in Nutrition.
(5 Marks)
- b) Explain the role of governmental institutions in food and nutrition in Zambia. (5 Marks)
- c) Elaborate on the coordination of nutrition in Zambia from national to Community levels.
(10 Marks)
3. Mary is a 45-year-old woman who has been experiencing challenges with her diet and medication. Despite following a low-carb diet and taking medication for high cholesterol, her blood lipid levels remain elevated. Her physician recommends Nutrigenomics and pharmacogenomics testing to better understand her unique genetic makeup. The results

reveal variations in genes associated with lipid metabolism and drug response, indicating that Mary may benefit from a different dietary plan and a personalized drug regimen.

- a) Describe what is meant by Nutrigenomics and Pharmacogenomics. **(4 Marks)**
 - b) Explain how the concept of Nutrigenomics and Pharmacogenomics could be used to optimize Mary's diet based on her genetic profile. Provide examples of specific gene-diet interactions that could influence her lipid metabolism. **(12 Marks)**
 - c) Explain what is meant by health informatics. **(4 Marks)**
4. Dr. Lisa is a bioinformatics researcher studying a newly discovered gene in a plant species. To understand its function, she needs to find similar sequences in other organisms and analyze the evolutionary relationships of the gene. She decides to use BLAST for sequence similarity searching and perform multiple sequence alignments followed by the construction of a phylogenetic tree.
- a) Describe the principle behind BLAST and how Dr. Lisa can use it to identify sequences similar to her newly discovered gene. Mention the different types of BLAST tools available and their specific uses. **(10 Marks)**
 - b) Discuss the importance of a phylogenetic tree in her study and multiple sequence alignments. **(10 Marks)**
5. a) You have just been recruited in the Ministry of Health as a Dietician and posted to Kasama General Hospital. The Hospital Management is of the view that you can play an important role in the management of the Hospital. Discuss the roles that you can play as a dietician in the hospital. **(10 Marks)**
- b) Explain what is involved in food service management. **(5 Marks)**
 - c) Discuss the principles and functions of food service management. **(5 Marks)**
6. a) You have been requested to do a clinical analysis of vitamin B complex deficiency, what sign would you look for in a patient? **(10 Marks)**

- b) If you are asked to do a biochemical analysis of the nutrition status of a patient, what are the possible types of analysis would you do? **(10 Marks)**
7. a) Explain the concept of Bioinformatics and Blast. **(10 Marks)**
- b) Discuss the importance of a phylogenetic tree i and multiple sequence alignments.
(10 Marks)