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1505E638

Candidate's Seat No :_____

BSc (Hons) FNS Sem.-6 Examination

FNS-324

Nutrigenomics & Food Biotechnology

May-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions: Illustrate your answers with neat diagrams wherever necessary.

Q. 1 Write the following

(i) Discuss the various branches of genomics and their specific applications in agriculture. Illustrate your answer with examples. (7 Marks)

(ii) Critically analyze the ethical, environmental, and social concerns associated with the use of biotechnology in food production. (7 Marks)

OR

(i) Evaluate the significance of agricultural genomics in the context of climate change. How does it contribute to the development of climate-resilient crops and sustainable farming practices? (7 Marks)

(ii) Explain the principles and techniques of DNA sequencing, particularly focusing on next-generation sequencing (NGS). How has it revolutionized food safety and traceability? (7 Marks)

Q. 2 Write the following

(i) What is Personalised Nutrition? Discuss the factors that helped in the inception of nutrigenomics and making Personalised Nutrition mainstream. (7 Marks)

(ii) Explain the role of nutrigenomics in neurodegenerative disease prevention and cardiovascular health (7 Marks)

OR

(i) How can nutrigenomics help in the development of functional food products? (7 Marks)

(ii) What are the major ethical challenges with nutrigenomics? Is it possible to make nutrigenomics accessible to all? How can you ensure equity with regard to latest nutrigenomic advancements? (7 Marks)

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Q.3 Write the following

(i) (i) Define personalized nutrition. Explain the features of it. (7 Marks)

(ii) Explain levels of personalized nutrition in detail. (7 Marks)

OR

(i) Explain nutrient responsive gene with suitable example. (7 Marks)

(ii) Differentiate between genotype based dietary guidelines and phenotype based dietary guidelines (7 Marks)

Q. 4 Write the following

(i) What is GM (Genetically Modified) foods? How genetically modification is done? Describe each & every step with a suitable diagram. (7 Marks)

(ii) Give an example of GM foods & describe development of any Four in detail [Flower-shower tomato, golden rice, BT cotton, transgenic banana & maize] (7 Marks)

OR

(i) Enlist advantages & disadvantages of GM foods. (7 Marks)

(ii) Short note on health concerns & environmental concerns associated with GM foods. (7 Marks)

Q 5. Attempt any seven out of twelve (14 Marks)

(i) What is nutrigenomics?
(ii) What is autophagy? How does it help against tumor progression?
(iii) What can be the effects of integrating artificial intelligence with nutrigenetics?
(iv) State any two environmental applications of genomics.
(v) Mention one DNA-based method used for detecting foodborne pathogens.
(vi) What is the significance of Golden Rice in addressing nutritional deficiencies?
(vii) How do GM seed patents raise ethical concerns?
(viii) What is a major health concern associated with GM foods? Why is assessing allergenicity crucial in the approval process of GM foods?
(ix) How does the Flavr Savr tomato achieve delayed ripening, and what gene is involved?
(x) General dietary guidelines
(xi) Ethical concerns in personalized nutrition
(xii) Define epigenetics