

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, PILANI CAMPUS
COMPREHENSIVE EXAMINATION: I SEMESTER: 2022-23
FOOD BIOTECHNOLOGY: BIOT 424
CLOSED BOOK

Max. Marks: 20 CB + 20 OB

Total time: 3h

Date: 19th, Dec.2022

NOTE: Answer all questions of the same part together. Begin each part from a new page. Collect OB answer sheets after submitting CB.

PART A (12M)

- Q1. Answer very briefly. (3)
- (i) What is the cause of Celiac disease?
 - (ii) What is somatic cell count. What does it indicate.
 - (iii) What enzymes are absent in Galactosemia disease?
 - (iv) Which product does India lead the world and which part of it is an illegal contaminant used illegally.
 - (v) Give an example of a water borne disease that can be prevented by vaccination.
 - (vi) Which microorganism is recommended to be used to check if autoclaving for sterilization has been successful
- Q2. Cite 4 reasons why should a person eat a colorful diet with suitable examples. (2)
- Q3. What is the difference in the mechanism of browning taking place in browning of cooked food and uncooked fruits? Describe. (2)
- Q4. Diagrammatically depict the rate of photosynthesis in climacteric and Non climacteric plants during the process of fruit ripening. (2)
- Q5. What do you mean by the term organoleptic? Give examples. (1)
- Q6. Suggest 4 chemical changes associated with ripening of fruits. (2)

PTO

PART B (8M)

7. What are the different types of food colorants? Mention the pros and cons associated with each type using suitable examples. (2)
8. Explain the rationale behind chocolate tempering process with the help of well-labeled diagram. (2)
9. In a tabular format, mention the important enzymes used in fruit juice industry along with the catalytic action and specific application in juice processing for each. (2)
10. Mention and explain briefly the important physicochemical properties that an emulsifier must possess to form effective emulsions during homogenization in food industry. Give suitable examples. (2)

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, PILANI CAMPUS
COMPREHENSIVE EXAMINATION: I SEMESTER: 2021-22
FOOD BIOTECHNOLOGY: BIOT 424
OPEN BOOK

Maximum Marks: 20

Total Time:3h

Date: 19th Dec 2021

PART A (12M)

NOTE: Answer all questions of the same part together. Begin each part from a new page

- Q1. Is artificial milk different from adulterated milk. Justify your answer briefly. (1)
- Q2. Suggest how you can determine if a food or it's product is genetically modified. (1)
- Q3. While eating foods we consume not only carbohydrates, lipids and protein but we also consume DNA. Can DNA consumed during eating food products also provide any nutritional benefits. Justify your answer. (1)
- Q4. Is it possible to have a food item which has (i) Zero carbohydrate (ii) Zero lipid. Justify your answer elucidating with suitable examples. (1)
- Q5. I protect against excess transpiration and give a shiny appearance to fruits. Who am I? (1)
- Q6. Suppose you have isolated a novel bacterial and want to test if it can be used as a SCP. What 4 parameters would you like to check. (1)
- Q7. Which 2 important mineral form a special dietary requirement for sports persons. Justify your answer. (1)
- Q8. Can Helium gas be used to preserve foods. Justify your answer. (1)
- Q9. Food poisoning is sometimes reported in schools providing free meals. Suppose you are a policy maker. Make 8 suggestions to ensure that such a situation does not recur. (2)
- Q10. Give reasons for (2)
- (i) Dry frying spices before adding to pickles
 - (ii) Adding salt to salads just before serving

PTO

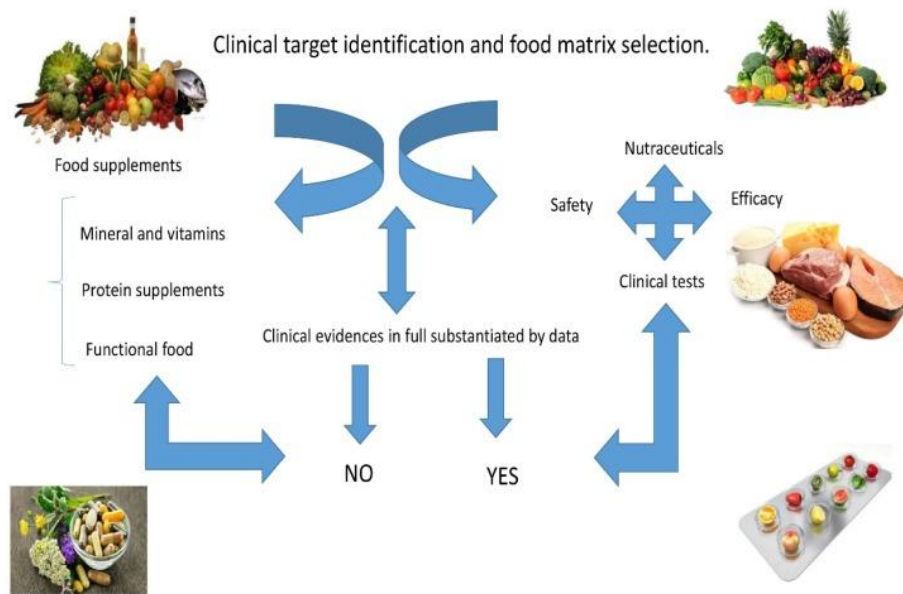
PART B (8M)

11. How do the major phenolic nutraceuticals present in legumes differ from those present in wine, tea and onion? Discuss briefly with respect to their chemical structures, metabolic transformations *in planta* and biological activities. (2)

12. Suppose you are recruited as advisor in a potato chips manufacturing company. Starting from harvest and concluding with packaging/transport, connect all the food conversion and food engineering operations learnt in the course to the different stages of processing. Write your answer point-wise. (2)

13. The following is a snapshot from a review article (*Santini A, Novellino E. To Nutraceuticals and Back: Rethinking a Concept. Foods. 2017 Sep 5;6(9):74*). Go through the same and answer the questions that follow.

Figure 1 shows the steps to take when assessing the possible use of a nutraceutical. It is of utmost importance the clinical target identification and the appropriate food matrix to use. The safety and the *in vitro* and *in vivo* tests are crucial. The differences between nutraceuticals and food supplements (e.g. mineral or protein food supplements) are also outlined, stressing the necessity of clinical evidences substantiating the health efficacy for nutraceuticals based on safety, efficacy, and known mechanism of action.



(i) What role does the food matrix play when assessing the possible use of a nutraceutical? Discuss briefly. (1)

(ii) Suggest the design of an experiment to substantiate the health efficacy for nutraceuticals based on safety. (1.5)

(iii) Suggest the design of an experiment to substantiate the health efficacy for nutraceuticals based on mechanism of action. (1.5)