

**MASTER OF SCIENCE (FOOD AND  
NUTRITION) M. SC. (DFSM)  
Term-End Examination  
December, 2022**

**MFN-003 : FOOD MICROBIOLOGY AND SAFETY**

*Time :  $2\frac{1}{2}$  Hours*

*Maximum Marks : 75*

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***Note :** Question No. 1 is compulsory. Attempt **five** questions in all. All questions carry equal marks.*

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1. (a) Give the 4D's approach you will follow for controlling rodents. 2
- (b) Give *one* example each of the uses of the following packaging material : 2
  - (i) Paper
  - (ii) Paper boards
  - (iii) Polyethylene
  - (iv) Laminated films
- (c) What do you understand by coding of food products ? Illustrate a bar code.  $2\frac{1}{2}$

- (d) List the *three* components of risk analysis, illustrating the relationship between the *three* components.  $2\frac{1}{2}$
- (e) What is the Food Safety and Standard Act (FSS Act) ? When was it enacted ? 2
- (f) Illustrate the classification of cleaning agents used in the food industry. 2
- (g) What are street foods ? List any *two* points you will keep in mind while preparing and processing street foods. 2
2. (a) Briefly discuss the uses of microorganisms in the food industry. Substantiate your answer with suitable examples. 8
- (b) Explain the different types of biological hazards and highlight how they can be a major concern in food safety. 7
3. (a) Illustrate the bacterial growth curve and enumerate the basic factors contributing to the growth of microorganisms. 10
- (b) What do you understand by the term 'GRAS' ? List a few GRAS chemicals that are widely used. 5

4. (a) Name the organisms involved in the spoilage of the following foods giving their ill effects : 4+4
- (i) Fruit juices and fruit preserves
  - (ii) Eggs
- (b) Give the symptoms, foods involved and the preventive measures of the following diseases : 4+3
- (i) *E. coli* diarrhoea
  - (ii) Aflatoxicosis
5. (a) Illustrate the food contaminants of natural origin, giving examples. 5
- (b) Discuss the uses of preservatives, anti-caking agents, sequestrants as additives in the food industry. 6
- (c) Name the adulterant and the harmful effects associated with the following : 4
- (i) Non-permitted colour used as colourant in Haldi and chilli powder
  - (ii) Epidemic dropsy
6. (a) What points would you keep in mind specific to storage of perishable, non-perishable and highly perishable foods ? 5

- (b) Present simple guidelines you would advocate for minimizing hazards associated with staff in a food service unit.

5

- (c) Enlist the role of the following international organization/agreement in the area of food standardization and quality control :

5

- (i) Codex alimentarius  
(ii) Technical Barrier to Trade (TBT)

7. Write short notes on any *three* of the following :

5+5+5

- (a) Importance of HACCP in ensuring food safety  
(b) Biodegradable material and environmental issues  
(c) Heavy metals and their concern to human health  
(d) Low temperature as a preservation technique  
(e) Concerns linked with dioxin-contaminated foods