

**FOOD BIOTECHNOLOGY**  
**(BIOT 3131)**

**Time Allotted : 2½ hrs**

**Full Marks : 60**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 4 (four) from Group B to E, taking one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group – A**

1. Answer any twelve:

**12 × 1 = 12**

*Choose the correct alternative for the following*

- (i) Maillard reaction is related to  
(a) Leather Industry (b) Detergent Industry  
(c) Baking Industry (d) All of these.
- (ii) Raffinase enzyme is used for preparation of  
(a) Sucrose (b) Lactose  
(c) Galactose (d) Starch.
- (iii) Acrylamide formation is inhibited in the presence of  
(a) DNase (b) Urate oxidase  
(c) Lactase (d) Asparaginase.
- (iv) Parabens are used as  
(a) Preservative (b) Humecants  
(c) Chelating agent (d) None of these.
- (v) Allium compounds are used as  
(a) Flavouring agent (b) Colouring agent  
(c) Humecants (d) None of these.
- (vi) Patulins are produced by  
(a) Cyanobacteria (b) Fungi  
(c) Algae (d) None of these.
- (vii) Neurotoxins are produced by  
(a) Cyanobacteria (b) Fungi  
(c) Algae (d) None of these.
- (viii) Sauerkraut is produced by fermenting shredded cabbage with  
(a) Propionic acid bacteria (b) Lactic acid bacteria  
(c) Acetic acid bacteria (d) All of these.

- (ix) Canning industry maintains sterility by  
 (a) Sucking out all air inside the can by vacuum pump  
 (b) With either N<sub>2</sub> or CO<sub>2</sub>  
 (c) Either of (a) or (b)  
 (d) None of the above.
- (x) Sterilization and autoclaving are  
 (a) Identical process (b) Totally different process  
 (c) Similar process (d) No relation.

*Fill in the blanks with the correct word*

- (xi) SCP refers to \_\_\_\_\_ protein.  
 (xii) Dill herbs are added to \_\_\_\_\_.  
 (xiii) Radurization and radication are \_\_\_\_\_ process.  
 (xiv) Roquefort cheese is \_\_\_\_\_ coloured.  
 (xv) Beer is prepared from \_\_\_\_\_.

### Group - B

2. (a) What are:  
 (i) Decimal Reduction Time  
 (ii) Thermal Death Time  
 (iii) Thermal Death Rate. [[CO2](Analyse/HOCQ)]  
 (b) Discuss the position of coldest point inside a can for solid and liquid food with diagrams. [[CO4](Remember/LOCQ)]  
 (c) Write in a flow chart the process for determination of TDT. [[CO2](Apply/IOCQ)]  
**(3 × 2) + 2 + 4 = 12**
3. (a) Differentiate between rancidity and putrefaction. [[CO2](Analyse/LOCQ)]  
 (b) What reaction occurs in putrefaction? [[CO4](Remember/LOCQ)]  
 (c) What are the different types of rancidity? [[CO3](Apply/IOCQ)]  
**4 + 4 + 4 = 12**

### Group - C

4. (a) Define the following:  
 (i) Mashing (ii) Malting (iii) Hop (iv) Wort. [[CO3](Explain/LOCQ)]  
 (b) Discuss the importance of malo-lactate fermentation in wine industry. [[CO1](Remember/LOCQ)]  
**(2 × 4) + 4 = 12**
5. (a) What are koji and moromi? Discuss their role in the making of soya sauce. [[CO4](Understand/IOCQ)]  
 (b) What is GMO? Discuss the molecular mechanism of production of FLAVR SAVR tomato. [[CO2](Remember/LOCQ)]  
**(3 + 3) + (2 + 4) = 12**

## Group - D

6. (a) Explain how carcinogenic compound formation is inhibited in baking industry. [[CO3](Explain/HOCQ)]  
(b) Illustrate different steps involved in complete hydrolysis of starch. [[CO4](Remember/LOCQ)]  
(c) Mention the mode of action of raffinase. [[CO4](Apply/IOCQ)]  
**4 + 6 + 2 = 12**
7. (a) Explain the role of gluten in bread preparation. [[CO3](Explain/IOCQ)]  
(b) Illustrate different steps involved in complete hydrolysis of lipid. [[CO4](Illustrate/LOCQ)]  
(c) Mention the mode of action of glucose oxidase. [[CO4](Apply/HOCQ)]  
**4 + 6 + 2 = 12**

## Group - E

8. (a) Briefly describe the mode of action of any two bacterial toxins. [[CO3](Analyse/IOCQ)]  
(b) Analyse different reactions involved in spoilage reaction in food. [[CO4](Remember/LOCQ)]  
(c) Define food additives with example. [[CO3](Apply/IOCQ)]  
**4 + 6 + 2 = 12**
9. (a) Mention the function of chelating agent and emulsifier and give example. [[CO3](Remember/IOCQ)]  
(b) Give examples of natural antioxidants and their mode of action. [[CO4](Memorize/LOCQ)]  
**6 + 6 = 12**

---

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	54.7	33.33	12.5

### Course Outcome (CO):

After the completion of the course students will be able to

1. Apply different food preservation technique
2. Know different food processing technique
3. Analyse processed food
4. Application of enzyme in food industry
5. Detect adulteration and toxic components of food
6. Gain knowledge on different functional food and GMO

\*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.

