**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**
**TEST -1 EXAMINATION- 2026**
M.Sc.III Semester (Biotechnology)
COURSE CODE (CREDITS):22MS1BT311 (02)
COURSE NAME: Food Biotechnology MAX. MARKS: 15
COURSE INSTRUCTOR:Dr Anil Kant MAX. TIME: 1 Hour

***Note:*** *(a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems (c) Use of calculator is not allowed*

| Q.No | Question | Marks |
|---|---|---|
| Q1 | a. Elaborate on essential components of food biotechnology.<br>b. Enlist any three active research areas of food fermentation, processing?<br>c. Identify three major causes of food spoilage and three different classes on foods with respect to ease of spoiling?<br>d. Demonstrate your understanding about hydrolytic rancidity and oxidative rancidity, their effect on food quality.<br>e. Why are alternate proteins getting importance? Briefly outline the role of food biotechnology in this area?<br>f. Heat treatments in general lower the quality of non cooked products like juices and beer with respect to taste aroma. A food technologist designing preservation treatment for two such products with pH 4.5 and 6.5. Which of these can be given less severe heat treatment while still achieving the same level of microbial control? Explain the reason.<br>g. Differentiate the redox potential (Eh)requirements of aerobic, anaerobic, and microaerophilic microorganisms.<br>h. What is poising capacity in a food system?<br>i. In a fermentation unit, a trainee technician was asked to handle a batch of fermentation, later it was found that it contained unusually low ethanol and elevated acetic acid. Identify the anomaly and types of microorganisms responsible. Also include the different types and significance of these organisms in the food industry.<br>j. In a cheese production unit, the production manager was asked to increase the relative proportion and contribution of *Lactococcus lactis* subsp cremoris during starter cultures and main fermentation. What steps you suggest, support your answer with logic. | 0.75x8 = 6.0 |
| Q2 | Explain the influence of any three intrinsic factors excluding moisture content, on extent and type microbial growth in foods. Give suitable example | 3 |
| Q3 | 1. Present a detailed account of similarities and difference between *Lactococcus lactis* subsp lactis and *Streptococcus thermophilus* wrt to physical, nutritional requirements and lactose metabolism. What is the Galactose Paradox?<br>2. Identify genera of organism, state its significance in food and food environment and one important species i) can tolerate 25%NaCl ii) can tolerate highest acid (pH4.2) iii) can tolerate 10% ethanol iv) produce a most potent neurotoxin v) bacteria enters inside the host cells and multiply | 6 |

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