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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2026

M.Sc.-IVSemester (Microbiology)

COURSE CODE (CREDITS):21MS1MB411(03)

MAX MARKS: 25

COURSE NAME: Food and Dairy Microbiology

COURSE INSTRUCTOR: Dr Anil Kant

MAX. TIME: 1 Hour 30 Min

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	Do any six out of following a. What is the significance of a heterofermentative lactic acid bacteria in food fermentation? Name one hetero fermentive genera of Lactic acid bacteria? b. Recall one psychrotrophic mold and its use in meat preservation. c. What is the pH range suitable for molds and yeast? d. Recognize highest acid tolerance bacteria and their role in foods? e. What role molds play in cheese production. Give two of such molds. f. Name highest alcohol tolerant bacteria and its significance. g. Mention high salt tolerant bacterial species and role in food production. h. Briefly explain following type of spore i) conidia ii) oospores	6
Q2	a. Briefly write the key characteristics, important species and importance of of following organisms in food industry- i) <i>Aspergillus sp</i> ii) Acetic acid bacteria b. Recognise the importance of following microorganisms wrt to food/? Include key characteristics, important species and significance with respect to food and food environment i) <i>Listeria monocytogenes</i> ii) <i>Clostridium</i> species	5
Q3	a. Demonstrate your understanding about the dilution to extinction method of estimating bacterial load. During such estimation the highest dilution in which bacterial growth was observed from one gram food samples sample diluted to 10^{-5}. What is the microbial load per gram in food? b. The big central square of the haemocytometer for estimation of microbial cells in food a sample and it was found that the average number of cells observed in its small square was 5.75. Calculate the number of microbial cells per gram of food. Five grams of solid food was dissolved in one liter of distilled water to prepare the sample?	5
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Q4	a. Discuss the similarities and differences between <i>Lactococcus lactis</i> and <i>Streptococcus thermophilus</i> with respect to i) physiological characteristics ii) Nutritional requirement iii) lactose is metabolization route. Mention galactose paradox its significance. b. Calculate the numbers of microorganisms per ml of milk with following parameters; average numbers of cells per microscopic field=25, Field Number (FN) of eye piece of microscope=20, magnification of objective = 80X, area of smear 1 cm²	5
Q5	Consider a microbiological sampling plan with the following parameters Number of samples (n) = 10 Accepted number of defective units number (c) = 3, Lower microbiological limit (m) = 2×10^5 CFU/ml, Upper microbiological limit (M) = 5×10^5 CFU/ml. Based on the following results obtained from testing, determine whether the food sample should be accepted or rejected. Provide a clear justification for each case. i) Four sampling units show microbial counts $\geq 2 \times 10^5$ CFU/ml, and none exceed 5×10^5 CFU/ml. ii) Three sampling units show microbial counts $\geq 2 \times 10^5$ CFU/ml, and none exceed 5×10^5 CFU/ml. iii) Two sampling units show microbial counts $\geq 2 \times 10^5$ CFU/ml, and one sampling unit exceeds 5×10^5 CFU/ml.	4