

Department of Biotechnology and Environmental Sciences

Thapar University

(under section 3 of UGC Act, 1956 vide notification# F12/84-U.3 of Govt. of India)

(Formerly Thapar Institute of Engineering & Technology)

End semester examination (2007-2008)

Course No. BT-003

Date of Examination: 29.05.2007

Maximum Marks: 36

Course Name: Applied Microbiology

Session: 900- 1200 hrs

Instructions:

- Please read the questions carefully
- Write legibly
- Draw diagrams/ Chemical Structure where ever necessary
- **ATTEMPT ANY FOUR (04) QUESTIONS IN SEQUENCE ONLY**

\*\*\*\*\*

- Q.1 (a) Which is the best method of enzyme immobilization and why? Give the applications of immobilized Enzymes. (1.5+1.5)
- (b) Define Probiotic. Give the name of a bacterium and yeast used which is used as a probiotic. (1.0+1.0)
- (c) What are the fermentation control parameters for dough fermentation in breadmaking? What does Chopin Rheofermentometer do in fermented bakery products? (1.5+1.0)
- (d) Give three ways by which the microbes contribute to the process of enhanced oil recovery. (1.5)
- Q. 2 (a) Define Vaccine. Give the difference between conjugate vaccine and subunit vaccine giving suitable examples. (1.0+1.5)
- (b) Explain in details the processes involved in commercial production of Beer. (350-500 words) (4.0)
- (c) Cheese and yoghurt both are fermented dairy products. How do they differ from each other in terms of raw products, starter cultures, and fermentation parameters? (1.5)
- (d) Give the name of wine making yeast and highlight its characteristics. (1.0)
- Q.3 (a) Write short notes on any two: (a) Algalization (b) Sherry (c) Liposome (d) Bioremediation (2.0)
- (b) What roles do the microbes play in the rhizosphere? (2.0)
- (c) What is mycoprotein? Give the well labeled diagram for the commercial production of Quorn. (1.0+3.0)
- (d) What are the processes used by microbes for recovery of gold and copper from their ores? (1.0)
- Q.4 (a) Define Biomining. Give the two major processes used by microbes in biomining. (1.0+0.5)
- (b) Give the difference between Lager beer and Ale? (1.5)
- (c) Which fermented beverage has an angel's share? What does angels' share refer to? (0.5+1.0)
- (d) Give the flowchart of production of motorgrade fuel ethanol (MGFE) highlighting the necessary conditions of each step. (4.5)

- Q.5 (a) Differentiate between wine and whisky on the basis of their commercial production processes comprising of raw material, cultures, fermentation parameters, post fermentation processes and packaging. (4.5)
- (b) What are Biopesticides? Give the advantages of Biopesticides over synthetic chemical pesticides. (2.5)
- (c) 10 grams of leaves have a total surface area of  $7396 \text{ cm}^2$ .  $10^{-6}$  dilution in the test tube gave 65 colony forming units (CFU) when 100 was dispensed on premade nutrient agar petri dish. Calculate the CFU/gm and CFU/  $\text{cm}^2$  of microbes present in the phylloplane? (2.0)
- Q.6 (a) "Microbes play an important role in supply of nitrogen to plants" Justify the statement. (3.0)
- (b) What are the fermentation parameters for the production of Penicillin? (1.5)
- (c) What is microbial commodity chemical? Highlight the role of microbes in the production of Acrylamide. (2.0)
- (d) Write briefly about (approx 250-300 words) any TWO: (i) Role of enzymes in food industry (ii) Thermophilic bacteria (iii) Phosphate solubilizing microbes and agriculture. (2.5)

\*\*\*\*\* *Best of Luck* \*\*\*\*\*