2018

FOOD MICROBIOLOGY

Paper : FPT 404

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer *any five* questions out of *six*.

1. *(a)* Based on morphology/shape, bacteria may be classified into which major groups ? Give examples.

    4

    (b) Discuss the structure of bacterial cell membrane in details with a schematic diagram.

    10

    (c) Briefly elaborate and explain the pure culture isolation technique using streaking method. Define D-value.

    5+1

2. (a) Give details on growth temperature and oxygen utilization as factors affecting bacterial growth. 8

   (b) Give a detail description of Embden-Meyerhof-Parnas (EMP) pathway. Give the major historical contribution of Louis Pasteur, Franz von Soxhlet, Peter Durand and Nicolas Appert in the area of Food Microbiology. 8+4

3. (a) Describe the fermentation profile of Yogurt, and Sauerkraut. 10

   (b) Write short notes on **any two** of the following : 2×5

   (i) Kefir

   (ii) Acidophilus milk

   (iii) Cheddar cheese fermentation.

4. (a) A Tetra packed fruit juice originally contained 3×10^5 cells of spoilage bacteria A, which has a D-value $1.5 min$ at $121°C$. The juice also has 8×10^6 cells of the spoilage bacteria B, which has a D-value $0.8 min$ at $121°C$. Calculate the thermal processing time for the fruit juice at $121°C$ needed to obtain a spoilage probability of $1/1000$. (Assume no lag time). 8

   (b) Explain principles of thermal sterilization and sterilization by irradiation. 8

   (c) Briefly describe classification of virus. 3×2 6

5. (a) Write short notes on **any four** of the following : 2·5×4

   (i) Symptom

   (ii) Etiology

   (iii) Incubation period

   (iv) Foodborne outbreak

   (v) Susceptible population.

   (b) Describe briefly the *three* ways foodborne pathogens that cause disease in humans. Explain with examples. 3×2

   (c) What are the major parts of a bacterial flagellum ? What are their functions ? 4

6. (a) Briefly describe etiology, pathogenesis, symptoms, and food vehicles for *any* **three** of the following : 3×5

    (i) Norovirus Infection

    (ii) Trichinosis

    (iii) Botulism

    (iv) ETEC gastroenteritis.

(b) Prove the mathematical derivation of the D-value/decimal reduction time. 5

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