53 (FPT 404) FDMB

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)* Briefly describe fermentation profile in ***any two*** of the following foods : 2×5

   (i) Sauerkrant

   (ii) Yogurt

   (iii) Swiss cheese.

   (b) Briefly elaborate on EMP pathway of sugar metabolism. 10

2. *(a)* Using a simple schematic diagram, explain the magnification achieved in a compound light microscope. 5

(b) Most of the microorganisms associated with food are heterotrophs or organoheterotrophs. — Explain with examples. 5

(c) What is Sterilization ? Briefly elaborate on the following two modes of sterilization : 2+(2×4)

(i) Heat sterilization

(ii) Sterilization by irradiation.

3. *(a)* Define D-value. Derive the mathematical formula for D-value. 2+8

(b) A fruit-juice have 3×10^5 population of spoilage bacteria "A" with a D-value of 1·5*min* at 121°C. It also carries the spoilage bacteria "B" with a population of 8×10^6 and a D-value of 0·8*min* at 121°C. Calculate the thermal processing time for this fruit juice at 121°C for achieving a spoilage probability of 1/1000. (Assume h_o lag time). 10

4. Write short notes on ***any four*** of the following foodborne pathogens, emphasizing on their characteristics, pathogenesis, symptoms, and common foodborne or associated vehicles. 4×5

(i) Enterohemorrhagic *Escherichia coli*

(ii) *Clostridium botulinum*

(iii) Norwalk virus

(iv) *Shigella dysenteriae*

(v) *Salmonella enteritidio.*

5. (a) Explain the principle of thermal inactivation of microorganisms. Describe briefly a simple batch retort and its operation in a sequence of steps. 3+8

(b) What is Pasteurization, and how does it differ from heat-sterilization ? 3

(c) Explain how pure culture of a microorganism is isolated and prepared using a simple diagram for demonstration. 6

6. *(a)* Describe how homofermentative lactic acid fermentation differ from heterofermentative pathway. 10

(b) Discuss the following factors affecting growth and survival of microorganism.

(i) Temperature

(ii) Presence/absence of oxygen. 5+5