Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech (FT)/SEM-7/FT-703B/2009-10

2009

FERMENTED FOOD PRODUCTS

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

   i) Which one of the following is an example of sugar metabolism pathway by food fermenting microorganism ?

      a) EMP

      b) Pentose phosphate

      c) Lactic acid fermentation

      d) All of these.

ii) Which one of the following represent one of the important biochemical reactions in heterolactic fermentation ?

a) Reduction of pyruvate to lactate, catalyzed by lactate dehydrogenase

b) Xylulose-5-phosphate cleaved to acetyl phosphate and glyceraldehydes-3-phosphate

c) Dihydroxy acetone phosphate is de-phosphorylated and reduced to glycerol

d) None of these.

iii) Who among the following presonalities developed canning technology ?

a) James Watson b) Louis Pasteur

c) Robert Koch d) Nicholas Appert.

iv) Microorganisms that prefer growing at lower temperature (20° C — 30° C OGT) but can grow at a temperature as high as 35°C and at as low as 0° C — 7° C are called

a) thermophiles b) psychrophiles

c) mesophiles d) none of these.

v) Which of the following is a starter microorganism for fermentation of miso ?

a) *Streptococcus thermophilus*

b) *Lactobacillus brevis*

c) *Streptococcus faecalis*

d) All of these.

vi) Ang-kak is a traditional fermented cereal product originated in which of the following countries ?

a) China b) Indonesia

c) India d) Japan.

vii) Which one of the following is used as beer adjunct ?

a) Hops

b) Malt

c) Corn starch

d) High-maltose syrups.

viii) Which one of the following is the starter LAB responsible for malolactic fermentation in wine ?

a) *Saccharomyces cerevisiae*

b) *Zymomonas mobilis*

c) *Pediococcus halophilus*

d) *Oenococcus oeni.*

ix) Which one of the following is a product obatined from fermentation of cabbage ?

a) Sauerkraut b) Dill pickle

c) Tofu d) All of these.

x) Which of the following is a dry sausage ?

a) Salami b) Papperoni

c) Plockwurst d) All of these.

xi) Which one of the following myoglobin-derived pigments is responsible for characteristic gray-brown colour of smoked, fermented sausage ?

a) Metmyoglobin

b) Oxynyoglobin

c) Nitric oxide metmyoglobin

d) Nitric oxide myoglobin.

xii) Which one of the following LAB is responsible for ropiness defect in yogurt ?

a) *Leuconostoc mesenteroides*

b) *Lactobacillus brevis*

c) *Pediococcus* spp.

d) *Streptococcis faecalis.*

xiii) Which one of the following durations for incubation for fish sauce fermentation is most commonly used by processors ?

a) 2 months for small fish, 5 months for large fish

b) 4 months for small fish, 10 months for large fish

c) 6 months for small fish, 18 months for large fish

d) 10 months for small fish, 22 months for large fish.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is the difference between straight dough and sour dough ? What is the average inoculation rate at which baker's yeast is added to dough for subsequent fermentation and leavening ? What is the starting material for commercial processing of baker's yeast ? $4 + \frac{1}{2} + \frac{1}{2}$

3. What is the major difference between fermentation in acidophilus milk and that in kefir ? Give a brief flow-diagram describing processing of cultured buttermilk. 1 + 4

4. Explain the significance of aeration system in fermentation tank for baker's yeast manufacturing, and describe briefly one such system used commonly use by bakery industries.

5. Give classification of various types of beer. What is hop ? 3 + 2

6. Write short note on any *one* of the following :

   a) Processing of sausage

   b) Fermentation involved in fish sauce processing

   c) Dry-salting and brine-salting of cucumber pickles.

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. Describe malting of barley in beer processing. Explain various pathways of sugar fermentation in beer fermentation. 7 + 8

8. Describe preparation steps for sauerkraut and explain microbiology of the fermentation process involved in this preparation.

9. Explain *koji* and mash fermentation in soy sauce processing. Natto is a traditional fermented soy bean product in Japan. What is the reason for which it could not become popular in the outside world ? Explain tempeh fermentation by giving a step-by-step account of the biochemical process. 9 + 2 + 4

10. Describe homo- and heterofermentation of lactose using simple reaction scheme. Briefly describe contribution of the two lactic starters to flavour and texture of yogurt. 9 + 6

11. Write short notes on any *three* of the following : 3 × 5

a) Metabolic contribution of meat starter cultures in sensory quality of sausages

b) Significance of salt (NaCl) and carbohydrates in vegetables fermentation

c) Diacetyl production in fermented dairy products

d) Alcohol fermentation by naturally occurring and starter yeasts in wine fermentation.