Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(FT)/SEM-4/FT-402/2011

2011
PRINCIPLES OF FOOD PRESERVATION

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 of the following : $10 \times 1 = 10$

   i) Anaerobic degradation of protein is called
      a) fermentation b) putrefaction
      c) lipolysis d) both (b) & (c).

   ii) During drying of vegetables the natural greenness of chlorophyll is converted to olive green pheophytin by losing
      a) Fe b) Mg
      c) I_2 d) P.

   iii) The a_w of milk is
      a) 0·97 b) 0·69
      c) 0·51 d) 0·80.

   iv) Before drying of egg the glucose content should be reduced by
      a) fermentation b) enzyme treatment
      c) both (a) and (b) d) none of these.

v) Which of the following is a combined preservation process ?
   a) Dehydration b) Hurdle technology
   c) Canning d) Pasteurization.

vi) Blanching is done
   a) to inactivate the enzymes
   b) to remove air
   c) to reduce microbial load
   d) all of these

vii) During freeze dehydration of food materials the pressure is maintained below
   a) 12 mm b) 4 mm
   c) 6 mm d) 72 mm.

viii) *Penicillium rouqueforti* is inoculated for the preparation of
   a) Blue cheese b) Swiss cheese
   c) Camembert cheese d) Cheddar cheese.

ix) Example of hard cheese is
   a) Cottage
   b) Blue
   c) Cream
   d) Permesan.

x) The main ingredient (s) for curing meat is/are
   a) nitrite b) salt
   c) corn syrup d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

$3 \times 5 = 15$

2. What is Bio-preservative ? Why is it beneficial than chemical preservatives ? Give some examples of producing microorganisms.

3. What are the defects of can containing food materials ?
4. What do you mean by IMF ? Give example of some IMF. What are the advantages of IMF ?
5. When $N_o = 4 \times 10^4$ spores were inoculated into a can containing 20g of product and processed at 121·1°C, processed product contain 10 spores/g. Calculate the equivalent heating time. (D = 2·0 min)
6. What types of microbial spoilage are found in canned foods?
7. Give four examples of chemical preservatives. For any two of them write down their mode of action and areas of use. 2 + 3
8. What is antibiotic ? Give two examples of it. What are the criteria for the selection of an antibiotic as food preservative? 1 + 1 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

9. Give the process flow sheet of canning process of pea. What is the function of lacquering agent ? Give examples of different lacquering agents for different food products. What is process time ? Briefly describe the process time calculation process (any one). Draw relationship between D value and Z value. 3 + 2 + 3 + 4 + 3
10. What are controlling factors of drying process ? Define free moisture, bound moisture, critical moisture and equilibrium moisture content of food material. Explain different phases of drying process with diagram. Define water activity. How is it related with equilibrium relative humidity? Define xerophilic, osmophilic microorganisms with example. 3 + 4 + 4 + 2 + 2

11. What is the basic principle and advantage of food preservation by fermented technology ? What is the beneficial effect of lactic fermentation ? What is the role of microorganisms in sauerkraut fermentation ? Briefly describe the process and advantages of hurdle technolgy ?
12. What is vinegar ? Discuss the fermentative process for production of vinegar. Briefly discuss the processing of wine with a flow diagram. 1 + 8 + 6
13. a) What is the difference between pasteurization & sterilization processes in food products ?
    b) Classify foods according to their pH. Explain the significance of this classification.
    c) What is blanching ? What are the disadvantages of blanching ? How can these advantages be minimized ?

    5 + 5 + 5
14. Write down the role of the following chemicals as preservative (any three) : 3 × 5
    a) Nitrite and nitrate.
    b) Benzoic acid.
    c) Sulfur dioxide.
    d) Sorbic acid.
    e) Propionic acid.