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END SEMESTER EXAMINATION, NOVEMBER-2018

Semester : 3rd

Subject Code : FPT-301

**INTRODUCTION TO FOOD
PROCESSING TECHNOLOGY**

Full Marks – 70

Time – Three hours

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

Instructions :

1. All questions of PART – A are compulsory.
2. Answer any five questions from PART – B.

PART – A

Marks – 25

- 1 Fill in the blanks :

1×10=10

- (a) _____ may be defined as substances which when eaten and absorbed by the body maintain life and growth.
- (b) _____ and bromelain are capable of digesting the connective tissue and muscle proteins and hence are used for tenderizing meat.

[Turn over

- (c) Plants can synthesize food in the form of carbohydrate by a process called ____.
 - (d) The energy value of food is measured in heat units called ____.
 - (e) The H-O-H bond angle in a water molecule is ____.
 - (f) Simpler carbohydrates are known as ____.
 - (g) ____ is composed of linear chain of amylose and branched chain of amylopectin.
 - (h) ____, a mixture of chymosin and pepsin is used for curdling in cheese making.
 - (i) Lactose is fermented by microorganisms to ____.
 - (j) ____ process destroys all pathogenic and other spoilage microorganisms.
2. Write true or false : 1×10=10
- (a) Glyceraldehyde is an aldose and Dihydroxyacetone a ketose.
 - (b) The major constituent of whey is lactose.
 - (c) Retinol is commonly known as Vitamin A.

- (d) The main physiological function of the vitamin in animals seems to be an antioxidant.
 - (e) In mammals, vitamin D is required for calcium absorption.
 - (f) Betalains give the characteristic red-purple colour of beet root.
 - (g) Digestibility of fermented foods increases.
 - (h) Non-perishable foods spoil readily unless special preservative methods are adopted.
 - (i) Yeasts are unicellular fungi of larger size.
 - (j) Amino acids are the building blocks of proteins.
- 3 Choose the correct answer : 1×5=5
- (a) Energy is required in the body for
 - (i) Basal metabolism
 - (ii) Thermogenesis
 - (iii) Growth and muscular activity
 - (iv) All of the above

(b) Beri-beri is caused due to deficiency of

- (i) Vitamin B₁ (ii) Biotin

(iii) Vitamin B₂ (iv) None of the above

(c) Which of the following is a fermented vegetable product?

- (i) Sauerkraut (ii) Tempeh

(iii) Cocoa (iii) All of the above

(d) During drying of some fruits, meat and fish etc. a hard impermeable skin is often formed at the surface. The phenomenon is called

(i) Cage hardening

(ii) Shrinkage

(iii) Thermoplasticity

(iv) None of the above

(e) Wet basis moisture content can be represented as

(i) $\frac{W_w}{W_w + W_d} \times 100$

(ii) $\frac{W_w}{W_d} \times 100$

(iii) $\frac{W_w}{W_w + W_d}$

(iv) $\frac{W_w}{W_d}$

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PART - B
Marks - 45

4 Answer the following questions : 3×3=9

(a) What are the three main types of nutrients based on their biological functions?

(b) Derive the relationship between wet basis moisture content and dry basis moisture content.

(c) Define water activity. How does water activity play a major role in food preservation?

5. Answer the following questions : 3×3=9

(a) What are reducing sugar and non-reducing sugar? Give example of each one with proper structure.

(b) What is enzymatic and non-enzymatic browning? How are they useful in food processing?

(c) What are essential fatty acids and why are they important?

6. Answer the following questions : 3×3=9

(a) Write three functions of proteins in foods.

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[Turn over

(b) What are the primary aims of drying of foods ?

(c) Describe the 12D concept in sterilization.

7. Answer the following questions : $3 \times 3 = 9$

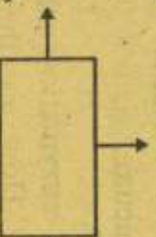
(a) What is food preservation ? List down the principles followed for food preservation.

(b) Why is the fermentation process an advantageous approach in food processing ?

(c) What is a chiral carbon ? Giving proper diagram, explain how to denote D- and L- representation of glyceraldehyde, fructose and galactose.

8. Answer the following questions : $5 + 4 = 9$

(a) $V = 50\text{kg}$



$F = 500\text{kg}$,

$MC = 22\% \text{ (wb)}$

$P = ?$, $MC = ?$

With reference to the block diagram given above calculate the weight of product after drying and the moisture content of the product in wet basis. (where, F = Initial weight of sample, V = Weight of moisture removed on drying, P = Final weight of product, MC = Moisture content)

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(b) 'Microorganisms are important in foods' - justify the statement with three examples. 4

9. Answer the following questions : $4.5 \times 2 = 9$

(a) What is an irradiation process ? Describe the types of irradiation treatment given to foods.

(b) Is irradiated food safe ? What were the issues being raised about the irradiated foods from its safety and wholesomeness standpoint ?

10. Explain the complete in-pack sterilization process. 9

11. Why is packaging of food necessary ? Write down the primary, secondary and tertiary types of food packaging for the commercial products such as Chocolate, Fruit juice, Biscuit and Butter. 9