



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH (FT-OLD)/SEM-4/FT-403/2012

2012

FOOD PROCESS TECHNOLOGY-I

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) In which stage of their life-cycle do insects cause maximum grain losses ?

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|----------|-----------|
| a) Egg | b) Pupa |
| c) Larva | d) Adult. |

(ii) After human consumption, what is the second most common usage of cereal grains ?

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|--------------------------|--------------------|
| a) Animal feed | b) Seed production |
| c) Industrial processing | d) None of these. |

(iii) Which one of the following is the outermost layer of a cereal grain ?

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|--------------|--------------|
| a) Testa | b) Pericarp |
| c) Scutellum | d) Endosperm |



(iv) Which one of the following is an indirect damage to cereal grains ?

- a) Loss of grains due to insects
- b) Loss of grains due to pests
- c) Contamination from arachnid body parts
- d) Microbial growth due to moisture migration.

(v) Which are two most common insect types causing damage to cereal grains ?

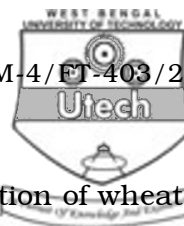
- a) Moth and beetle b) Moth and fly
- c) Beetle and fly d) None of these.

vi) Which one of the following impurities in cereal grain cannot be removed by separation ?

- a) Stones
- b) Mud adhered to grains
- c) Plant parts
- d) Rodents hairs.

(vii) Which one of the following is a principle for separation of impurities from cereal grains ?

- a) Size b) Specific gravity
- c) Composition d) all of these.



(viii) Which one of the following is a classification of wheat on the basis of its baking characteristics ?

- a) Mealiness and virtuousness
- b) Hard and soft
- c) Strong and weak
- d) none of these.

(ix) The two cereal grains that are bred together to produce *triticale*

- a) Rice and wheat
- b) Wheat and rye
- c) Rye and barley
- d) Barley and rice.

(x) Which one of the following nutrients is incorporates into rice kernel during enrichment of rice ?

- a) Starch
- b) Fat and oil
- c) Protein
- d) Vitamin.

(xi) Solvent extraction milling (SEM) is used in wet milling of which of the following cereal grains ?

- a) Wheat
- b) Corn
- c) Rice
- d) Barley.



(xii) Name the pigment that is oxidized during bleaching of flour ?

- a) Carotenoid b) Betalin
- c) Chlorophyll d) Xanthophyll.

(xiii) Which one of the following is the correct range of protein in cake flour ?

- a) 6 – 9% b) 10 – 14 %
- c) 12 – 16% d) 14 – 18%

(xiv) For which one of the following flour products, quality is greatly influenced by particle size of flour ?

- a) Wafer b) Bread
- c) Biscuit d) None of these.

(xv) Which one of the following microorganisms is used for production of ethanol from corn ?

- a) *Lactobacillus bulgaricus*
- b) *Lactococcus lactis*
- c) *Aspergillus flavus*
- d) *Saccharomyces cerevisiae* .



(xvi) What is the correct range of fat content in cocoa liquor ?

- a) 22 – 35% b) 35 – 52%
c) 52 – 58% d) 58 – 70%.

GROUP – B

(Short Answer Type Questions)

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

2. Write the flow-diagram for ethanol production from corn. Give one use of CO₂ produced during this process in a food application. 4 + 1
3. Briefly describe how stoning machine separates stones from cereal grains with a simple schematic diagram. What is the principle of separation used in a metal detector ? 4 + 1
4. What is the principal difference between killing pests by fumigants and killing pests by insecticide ? Name a mold that produces aflatoxin in cereal grains. Name three types of rodents most commonly responsible for loss of cereal grains. 1 + 1 + 3
5. Describe the changes that occur during dehydration of vegetables. What is the main difference between jams and jellies. 4 + 1



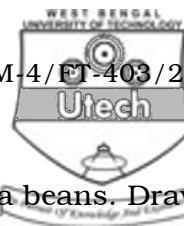
6. What is the main objective of blanching vegetables ? Why vegetables like green peas and green beans are always blanched ? Also, when is it appropriate to subject fruits to heat blanching ? 1 + 2 + 2
7. Name a compound responsible for the astringent taste in tea, and is produced during fermentation of tea. Describe the vacuum coffee brewing process with a schematic diagram appropriately labeled. 1 + 4

GROUP – C

(Long Answer Type Questions)

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

8. Write the flow diagram of production of canned fruit juice, and describe the process of juice extraction and juice pasteurization in details. Pickling involves reduction of pH of the media in which vegetables are stored. What are the two desired changes achieved by this pH reduction ? 12 + 3
9. Write the flow diagram of black tea processing, and describe in detail the steps rolling, fermentation and firing. What are the two grades of tea ? Name one processing step in the black tea processing that is omitted in green tea processing. 12 + 2 + 1
10. Among the traditional processes of wet-milling of wheat, 'alkali process' produces non-vital gluten. Why ? Describe the first three steps in the wet-milling process of maize/corn. Name the enzyme that transforms glucose syrup into high fructose corn syrup (HFCS). What is the significance of HFCS in food processing ? 3 + 9 + 1 + 2



11. Describe the three-stage fermentation of cocoa beans. Draw a simple schematic diagram (with labels) of a hydraulic press used for separation of cocoa butter from alkalized cocoa liquor. 10 + 5
12. Describe the process of parboiling of rice, and explain how it enriches rice kernel. Describe briefly the genetic engineering involved in developing the variety 'golden rice'. What is its nutritional significance in the developing world ? 9 + 4 + 2
13. Describe briefly (with a schematic diagram) cross-flow 'mixer' drier used for drying cereal grains. What is the advantage of this type of drier over a 'non-mixer' drier ? Explain with a simple example, why the 'conventional screening' system is less efficient in cleaning and separating impurities from cereal grain than the 'loop system screening' with a 'concentrator' in the upstream. What is a major objective of conditioning / damping of cereal grains ? 6 + 1 + 7 + 1
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