MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE SEMESTER END EXAMINATION

B.Tech. (Food Science)

Semester : III (New)  Academic Year : 2009-10
Course No. : FCN 235  Title : Techniques in Food Analysis
Credits : 3(1+2)  Day & Date : Friday, 13.11.2009

Time : 9.00 to 11.00  Total Marks : 40

Note: 1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Write a note on methodology of paper chromatography.

Q.2 What is dialysis? Explain the purpose of dialysis of protein samples during their purification.

Q.3 What is thin layer chromatography? State the applications of TLC.

Q.4 Write the principle of atomic absorption spectroscopy with mode of operation.

Q.5 What is SDS-PAGE? Describe the principle of separation of properties by SDS-PAGE.

Q.6 Write the applications of IR spectroscopy.

Q.7 Write the principle and application of electrophoresis.

SECTION "B"

Q.8 Define the followings.
1) Retention time  2) Ultrafiltration  3) Beer Lambert’s law
4) Affinity chromatography  5) Electrophoresis

Q.9 Fill in the blanks.
1) HPLC is a advanced form of _______ chromatography technique.
2) Gel filtration is widely used for the separation of _______.
3) The detector is activated to release _______ by the beam transmitted light.
4) PAGE, _______ is used as cross linking agent.
5) An anion-exchange resin will bind (exchange) _______ from the sample.

Q.10 Write the full forms of the followings.
1) NMR  2) AAS  3) SEC
4) GLC  5) HPTLC

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SECTION "A"

Q.1 What are the basic technical considerations to be considered by technologist prior to confection processing?

Q.2 Outline the process to manufacture chewing gums.

Q.3 Define chocolate and describe the process of manufacture milk chocolate.

Q.4 Explain the manufacturing process for:
   1) Fruit toffee
   2) Marshmallow

Q.5 Explain the quality attributes of Carmel and describe the process to manufacture it.

Q.6 Write short notes on:
   1) Doctor sugar
   2) Tablets

Q.7 Explain the batch process for manufacturing high boiled sweets.

SECTION "B"

Q.8 Define the following terms.
   1) Dextrose equivalent
   2) Bubble gums
   3) Nougats
   4) Tempering of chocolate
   5) Lozenges

Q.9 Fill in the blanks.
   1) Boiled sweets which contain more than ________ % moisture will normally grain during storage.
   2) Sorbitol is widely used in chewing gums as a ________ .
   3) Glucose syrup contains ________ and ________ sugars.
   4) ________ is used as an anti-caking agent in icing sugar.
   5) ________ sugar gives diabetic properties.

Q.10 State True or False.
   1) To stabilize the acidity of confections 0.1N NaOH solution is used.
   2) Conching is performed for flavour development.
   3) Honey is used as a sweetener, as it contains lower amount of reducing sugar.
   4) Marshmallows are more susceptible to mold growth.
   5) Glucose syrup is added to sugar to reduce the cost.
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

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<tr>
<td>III (New)</td>
<td>FE 235</td>
<td>3(2+1)</td>
<td>Saturday, 14.11.2009</td>
<td>9.00 to 12.00</td>
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Academic Year : 2009-10
Title : Food Processing Equipment-1

Note: 1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Explain the characteristics of raw materials governing the selection of size reduction equipment.

Q.2 Describe the factors affecting growth of microorganisms in sterilization.

Q.3 Differentiate the followings.
   1) Hammer mill and Disc attrition mill
   2) Newtonian and Non Newtonian liquid

Q.4 Classify the cleaning methods and describe in detail the flotation washing.

Q.5 State the basic types of mixing systems and describe the tumbler mixers.

Q.6 Write short notes on.
   1) Fluidized bed drying
   2) Energy requirement for comminution of solids.

Q.7 What is evaporation? Explain the ‘Heat load’ of an evaporator system.

SECTION “B”

Q.8 Fill in the blanks with suitable words.
   1) Eggs are graded manually by ________.
   2) ________ agitators are effective in mixing of moderate viscous liquids.
   3) In the crushing rolls, ________ force is used for size reduction.
   4) ________ means the number of wires per lineal inch.
   5) ________ screens are permanently clad with screen beds having fixed size and shape of apertures.
   6) The size reduction ratio for fine grinding is ________.
   7) Ultrasonic waves are ________ waves of frequencies above 16 KHz.
   8) Segregation in a mixture of dry solids is readily detected by use of ________ test.
   9) In evaporation of liquid, more the concentration of a liquid more will be the ________.
   10) ________ is defined as the mass of particles occupied by a unit volume of bed.

(P.T.O.)
Q.9  State True or False.
1) The Dole aseptic canning process uses superheated steam to effect sterilization of cans and lids.
2) TDT is the time required to kill a culture at any predetermined temperature.
3) Dry milling tends to produce fine particles than wet milling.
4) In disc attrition mill, impact force is utilized for size reduction.
5) Saturated steam is a best fuel for the food industries.
6) More case hardening in fruit and meat is formed.
7) The greater the number of effects, the better the steam economy.
8) The D value means the reduction of spore concentration through one cycle at varied temperatures.
9) Water activity is controlled in evaporation of food.
10) Moisture content on wet basis is the amount of water per unit mass of dry solids.

Q.10  Define the followings.
1) ‘Z’ value
2) Fo value
3) Sterilization
4) Mixing
5) Size reduction
6) Terminal velocity of grain
7) Critical speed of mill
8) Non Newtonian fluid
9) Screening
10) Dehydration
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

Semester : III (New)  Academic Year : 2009-10
Course No. : FE 236  Title : Food Packaging
Credits : 3(2+1)  Time : 9.00 to 12.00  Total Marks : 80
Day & Date : Monday, 16.11.2009

Note: 1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 What are the various hazards acting on a packaging during storage?
Q.2 State and discuss the advantages of aseptic packaging.
Q.3 Write short notes on:
   1) Lamination
   2) Standard Weight Measure Act (SWMA)
Q.4 Suggest suitable type of package material for packing of following products with
   suitable reason.
   1) Milk Powder
   2) Carbonated beverage
Q.5 Why food is packed? Explain with suitable examples how package assists the sale
   of products.
Q.6 Enlist and explain source and properties of different types of papers used in
   packing the food.
Q.7 What are the advantages of edible films over traditional synthetic polymeric
   packing material? Explain.

SECTION "B"

Q.8 State True or False.
   1) Handling ears should be provided to avoid the hook hazards.
   2) Higher the drop height lesser will be the impact.
   3) Due point temperature is related to frozen foods.
   4) Aseptic packaging results in 1-2 percent energy saving.
   5) Impact of hazards is more in developed countries rather than the developing
      countries.
   6) Bubbled polyethylene is used as cushioning system.
   7) Corrugated boxes are generally used for liquid packaging.
   8) Bleached paper is generally more expensive and weaker than the unbleached
      paper.
   9) Fiber drums can vary in size with diameters from 180 mm to 600 mm.
   10) Three metals have commonly used as a materials for the packaging.

(P.T.O.)
Q.9  a) Match the pairs.

"A" Effect in glass  "B" Coloring Agents

(1) Blue  (a) Co$_3$O$_4$ (+Mn, Ni, Fe, Cu, Cr oxides)
(2) Green  (b) CdS + Se
(3) Amber  (c) Na$_2$S
(4) Orange  (d) Co$_3$O$_4$, Cu$_2$O + CuO
(5) Black  (e) Cr$_2$O$_3$, Fe$_2$O$_3$ + Cr$_2$O$_3$ + CuO, V$_2$O$_3$

b) Spell out the abbreviations.
1) PP  2) PA  3) CA  4) DP  5) VLDPE

Q.10 Define the followings.

1) Folding cartoon  6) Paper and paper boards
2) Primary packaging  7) Glass
3) Plastic material  8) Annealing
4) Edible films and coating  9) Absorbent packaging material
5) Compatibility  10) Dampness
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
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<td>Day &amp; Date</td>
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<tr>
<td>Time</td>
<td>9.00 to 12.00</td>
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<td>Total Marks</td>
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</table>

Title: Fermentation and Industrial Microbiology

Note:
1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 State various types of fermentors and describe the functions of each accessory.
Q.2 What is SCP, give its use and explain in brief the production of SCP.
Q.3 Describe downstream processing of any one enzyme.
Q.4 Enlist the media ingredients used in production of penicillin and state the role of each ingredient.
Q.5 Give an account of various enzymes used in food and allied industries.
Q.6 Describe fermentation of citric acid by Aspergillus niger using molasses.
Q.7 Describe different methods of strain improvement for high yield of fermented products.

SECTION "B"

Q.8 Define / Explain the following terms.
   1) Screening
   2) Natto
   3) LAB
   4) Antibiotics
   5) Bacteriocins
   6) Hops
   7) Inoculum
   8) Dry wines
   9) Downstream processing
   10) Surface fermentation

Q.9 State True or False.
   1) Amino acids are enzymes.
   2) Citric acid is only synthesized by bacteria.
   3) Vitamins are produced by fermentation.
   4) Ion exchange Resins are used for purification of proteins.
   5) Rennin is used during cheese production.
   6) Algae can be used as food and animal feed.
   7) Mushrooms are edible fungi.
   8) Alcoholic beverages are obtained from cereals.
   9) Streptomycin antibiotic fermentation does not require any precursor.
   10) Fermentation is always beneficial for human beings.

(P.T.O.)
Q.10 Fill in the blanks.
1) _______ addition in fermentor controls the foam, formed during fermentation.
2) _______ commercial homogenizer is used for separation of fermented broth in enzyme fermentation.
3) _______ algae is first used as source of SCP.
4) Wine contains _______ % of alcohol.
5) _______ amino acid is obtained from Corynebacterium glutamium.
6) _______ enzyme has great application in baking industry.
7) _______ antibiotic is obtained from P. Chryogenum.
8) Sauerkraut is obtained from _______.
9) _______ vinegar is produced from fermented apple juice.
10) _______ is oriental fermented food in which R. oligosporus is used.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

Semester : III (New)  
Course No. : FST 235  
Credits : 3(2+1)  
Day & Date : Monday, 9.11.2009  
Academic Year : 2009-10  
Title : Legumes and Oilseeds Technology

Note:  
1. Solve ANY FIVE questions from SECTION "A".  
2. All questions from SECTION "B" are compulsory.  
3. All questions carry equal marks.  
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Discuss different steps of refining of crude vegetable oil with its significance.
Q.2 Outline the methods of milling of legumes and explain milling of red gram.
Q.3 Explain role of each anti nutritional factor of legumes and oil seeds.
Q.4 Explain chemical composition of legumes with respect to proteins and carbohydrates.
Q.5 How cooking quality of legumes is affected by different factors.
Q.6 Outline different fermented foods prepared from legumes.
Q.7 Write short notes on:
   1) Classification of legumes
   2) Delinting of cotton seed

SECTION "B"

Q.8 Define the followings.
   1) PUFA  
   2) Flaking of oil seeds  
   3) Defatted Meal  
   4) Phytate phosphorus  
   5) Lecithin  
   6) Miscella  
   7) Dehusking of legumes  
   8) Roasting of groundnut  
   9) Peanut butter  
  10) Hexane

Q.9 State True or False.
   1) Seed coat of bean seed is thick in nature.
   2) Soybean is cylindrical in shape.
   3) Horse gram has medicinal value.
   4) Linoleic is the saturated fatty acid present in legume.
   5) Lysine is a phospholipid of soybean.
   6) Soya isoflavone is recommended in menopause.
   7) Dehusking increases foaming and emulsion capacity of flour.
   8) Prolonged cooking affects nutritional value of legumes.
   9) Use of sodium bicarbonate reduces cooking time of legume.
  10) Extrusion cooking is a method of cooking legumes.

(P.T.O.)
1.10 Match the followings.

<table>
<thead>
<tr>
<th>“A”</th>
<th>“B”</th>
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<tbody>
<tr>
<td>(1) Goitrogens</td>
<td>(a) Fermented product</td>
</tr>
<tr>
<td>(2) Red gram</td>
<td>(b) Hard to cook legume</td>
</tr>
<tr>
<td>(3) Idli</td>
<td>(c) Cleaning of legumes</td>
</tr>
<tr>
<td>(4) Sodium bicarbonate</td>
<td>(d) Cotton seed</td>
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<tr>
<td>(5) Bengal gram</td>
<td>(e) Hard legume</td>
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<tr>
<td>(6) Aspirator</td>
<td>(f) Dehusked whole legume</td>
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<tr>
<td>(7) Gossypol</td>
<td>(g) Perotein concentrate</td>
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<tr>
<td>(8) Oilseed meal</td>
<td>(h) Highest oligosaccharides</td>
</tr>
<tr>
<td>(9) Conditioning</td>
<td>(i) Thyroid glands</td>
</tr>
<tr>
<td>(10) Gota</td>
<td>(j) Pre milling treatment of legumes</td>
</tr>
</tbody>
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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
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B.Tech. (Food Science)

Semester: III (New)  Academic Year: 2009-10
Course No.: FST 236  Title: Meat, Poultry and Fish Technology
Credits: 3(2+1)  Day & Date: Tuesday, 10.11.2009

Note: 1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Describe with diagram the structure of egg in detail.

Q.2 Give the classification of poultry birds and enlist various steps involved in slaughtering of poultry.

Q.3 Explain in brief the physico-chemical properties of meat.

Q.4 Explain post harvest handling of fishes and care to be taken during handling, preservation and processing of fish.

Q.5 Explain different methods for tenderization of meat and give detail information of any two.

Q.6 Enlist the various methods used to judge the egg quality. Explain any one in detail.

Q.7 Write short notes on.
   1) Myoglobin
   2) Evisceration
   3) Halal method of slaughtering
   4) Methods of preservation of fish

SECTION "B"

Q.8 Define following terms.
   1) Meat  6) Liarrage
   2) Stunning  7) Scalding
   3) Yolk index  8) Pelagic fish
   4) Pork  9) Inland fishery
   5) Haugh unit  10) Smoking

Q.9 State True or False.
   1) Sodium nitrate is responsible for colour fixation in meats.
   2) Muscle of fresh fish should not be elastic.
   3) Anti mortem inspection is done to prevent health hazards.
   4) Accumulation of lactic acid in meat is due to aerobic glycolysis.
   5) Halal is Islamic method of slaughtering.

(P.T.O.)
6) Only molar index is used for estimation of age of animal.
7) The digestibility of fish muscle is more than other meat muscles.
8) Air cell size decides the age of eggs.
9) Poultry meat is also known as red meat.
10) Low ratio of meat to bone indicates good quality of meat.

Q.10 Fill in the blanks.
1) The major inner components of muscle fiber are ________.
2) ________ fishes do not have shells.
3) The egg shell cuticle is ________ in nature.
4) ________ is the chief pigment responsible for the pink to red colour of meat muscle.
5) Rendering is the process of extraction of ________.
6) Indian major carps belong to ________ water.
7) Lean fish contains less than ________ % lipid.
8) Final pH in slaughtering is known as ________.
9) Castrated male bovine is called as ________.
10) The major protein of egg white is ________.

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B.Tech. (Food Science)

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<td>Title</td>
<td>Wheat Milling and Baking Technology</td>
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Note: 1. Solve ANY FIVE questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Discuss the ingredients and process of bread making using straight and sponge dough method?

Q.2 Write the principle and methods of conditioning of wheat.

Q.3 a) Describe the role of different bakery ingredients in Bake products.
   b) Rheological properties of dough.

Q.4 Describe the structure and chemical constituents of wheat with importance of different parts.

Q.5 Explain design and operation of wheat milling process.

Q.6 Write on  a) Different products of wheat milling industry.
               b) Quality control of Biscuits.

Q.7 State the importance of wheat and explain its different types.

SECTION "B"

Q.8 Define the followings.
   1) Oxidizing agent 6) Leavening agent
   2) Flour additives 7) Reduction Roll
   3) Crackers         8) Quality of wheat
   4) Vitreous wheat   9) Flour improvers
   5) Shortening       10) Bleaching agent

Q.9 Fill in the blanks.
   1) _______ measures the amount of force required to extrudade the dough.
   2) Optimum Moisture content required for milling of wheat is _______%.
   3) Endosperm of soft wheat fractures in _______ ways.
   4) Yeast acts as a _______ in dough making.
   5) Glutelin is the major component of _______.

(P.T.O.)
6) _______ is used for measuring strength of dough.
7) Hyaline layer is _______ of seed coat of Wheat.
8) Crude fiber is concentrated in _______ of wheat.
9) Vitreous wheat is related with _______ protein content.
10) Bran of wheat is rich in _______.

Q.10 State True or False.
1) Extra hard wheat is used for making Biscuit, Cake & Cookies.
2) Tritium durum is soft wheat.
3) Specific gravity of mealy wheat is lower than vitreous wheat.
4) Maturographs are used to measure the properties of fermenting dough.
5) Crumb texture of strong wheat is very poor.
6) Color and adjuncts are used as a flour additive.
7) Hardness and softness of wheat are related to degree of adhesion between starch and protein matrix.
8) Hot conditioning is not followed in wheat.
9) The wheat with more than 12% of protein is used for preparation of cake and cookies.
10) Salt has toughening action on gluten.

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