SECTION "A"

Q.1 Enlist different machineries used in commercial milling of legumes and state their uses.

Q.2 State various methods of oil extraction and explain any one in detail.

Q.3 Enlist the various anti nutritional factors in legumes and explain any three in detail.

Q.4 Discuss various methods of legume cooking.

Q.5 Explain the parboiling of rice in detail.


Q.7 Describe the steps in preparation of oilseed and methods for efficient oil extraction.

SECTION "B"

Q.8 Define following terms.
   1) Aspiration  2) Hydrogenation of oil  3) Whitening of rice
   4) Dejinting of cottonseed  5) Germination

Q.9 State True or False.
   1) Saponins are highly toxic to warm blooded animals.
   2) The protein content of cereals is less than that of legumes.
   3) Legumes are rich in S-containing amino acids.
   4) Milling losses are more in modern method.
   5) Unsaturated fatty acids contain double bond in their structure.

Q.10 State the significance of following in one sentences
   1) Polishing of dhal
   2) Pitting of legume
   3) Physical refining of oil
   4) Dehusking before milling
   5) Flaking of oilseed

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

<table>
<thead>
<tr>
<th>Semester</th>
<th>VII</th>
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<tbody>
<tr>
<td>Course No.</td>
<td>FST 4722</td>
</tr>
<tr>
<td>Credits</td>
<td>2(1+1)</td>
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<tr>
<td>Day &amp; Date</td>
<td>Monday, 16.11.2009</td>
</tr>
<tr>
<td>Time</td>
<td>9.00 to 11.00</td>
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<td>Total Marks</td>
<td>40</td>
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Title Extrusion Product 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 Describe various factors that affect the quality of extruded products.

Q.2 Draw a neat and well labeled diagram of an single screw extruder and explain the different parts of extruder.

Q.3 Write the principle involved in extrusion cooking and give the comments on scope of extrusion cooking.

Q.4 State various applications of extrusion cooking. Describe any one application in product development.

Q.5 State various quality parameters for extruded products with suitable examples.

Q.6 Differentiate between single screw extruder and twin screw extruder, with respect to their design and operation.

Q.7 Write short notes on:
   1) Texturized vegetable protein
   2) RTE (Breakfast) cereals

SECTION "B"

Q.8 State True or False.

1) There is product expansion during extrusion cooking.
2) Extrusion cooking may be applied to the manufacture of bread.
3) Increasing the screw speed above the limit increases the specific mechanical energy input.
4) The trypsin inhibitor is destroyed during extrusion cooking.
5) The moisture content is maintained less than 5 per cent in RTE snacks.

Q.9 Match the pairs.

<table>
<thead>
<tr>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texturized vegetable protein</td>
<td>(a) Fish noodles</td>
</tr>
<tr>
<td>Confectionery product</td>
<td>(b) Hydrolysed caseinate</td>
</tr>
<tr>
<td>Dairy food</td>
<td>(c) Fruitgums chocolate</td>
</tr>
<tr>
<td>Fairmaeous food</td>
<td>(d) Caramel and toffees</td>
</tr>
<tr>
<td>Sweet articles</td>
<td>(e) Meat analogues</td>
</tr>
</tbody>
</table>

(P.T.O.)
Q.10 Fill in the blanks with suitable technological words.

1) The starch is _______ during extrusion cooking.
   (a) Denatured    (b) Gelatinized
   (c) Inactivated

2) _______ is an excellent raw material for meat analogues.
   (a) Soya-protein   (b) Peanuts
   (c) None of it

3) In Single screw extruder the length diameter ratio is _______.
   (a) 4-25           (b) 10-40
   (c) None of it

4) The section of the screw, where the feed enters is commonly called the _______.
   (a) Feed section   (b) Compression section
   (c) Metering section

5) Expanded RTE cereals are manufactured by extrusion cooking at a moisture content of _______.
   (a) >20%          (b) >10%
   (c) >30%

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

Semester : VII  Academic Year : 2009-10
Course No. : FST 4723  Title : Legume Milling Technology
Credits : 2(1+1)
Day & Date : Tuesday, 17.11.2009  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 What are the different cultivated legumes that are used for milling?
Q.2 What are the advantages of milling the legumes?
Q.3 What are the differences between wet milled dal and dry milled dal? How
   legumes are dry milled on home scale level.
Q.4 Enlist the problems associated with pulse milling industry.
Q.5 Enlist the factors affecting pulse milling outturn.
Q.6 How Tur dal is prepared by wet milling process.
Q.7 Describe the structure of a legume seed.

SECTION "B"

Q.8 Fill in the blanks.
   1) ________% of oil is applied to legumes before milling.
   2) Increase in dehulling results in ________losses of nutrients.
   3) Wet grains are dried for ________days before dehusking.
   4) The quantity of red earth applied is ________%.
   5) In dry milling the yield of dal varies ________%.

Q.9 Give reasons for the following statements.
   1) A depression is present at center of wet milled legume.
   2) Legumes are dehusked and consumed.
   3) Oil is applied before milling.
   4) Red earth is applied before dehusking.
   5) Grains are pitted before conditioning.

Q.10 State True or False.
   1) Milling of Bengal gram is comparatively easy than black gram.
   2) Legumes are rich source of lysine.
   3) Red earth imparts red colour to dal.
   4) Wet milled grains are flat in appearance.
   5) Generally groundnut oil is applied to legume before milling.
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Food Science)

Semester : VII  Academic Year : 2009-10
Course No. : FST 4721  Title : Protein Food Technology
Credits : 2(1+1)
Day & Date : Saturday, 14.11.2009  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 Classify the different amino acids. Also define the proteins.
Q.2 Classify the proteins along with one example of each group.
Q.3 What are the different properties of proteins?
Q.4 Describe the different plant sources for protein availabilities.
Q.5 Describe various anti-nutritional factors in oilseeds.
Q.6 What are the advantages and disadvantages of using legumes as protein sources?
Q.7 Write short notes on any two.
   1) Protein fortified bakery products.   2) Preparation of soya milk
   3) Low cost weaning food.

SECTION "B"

Q.8 Fill in the blanks.
   1) Legume proteins are deficient in ________ amino acid.
   2) Acceptability of soya milk is less due to ________ flavour.
   3) Proteins from pulses are of low quality since they are deficit in the ________.
   4) Brinjal vegetable protein content is ________%.
   5) Groundnut protein isolate contains ________% of protein.

Q.9 State True or False.
   1) Protein concentrates contain more protein than protein isolate.
   2) Roasted soyabean protein is more digestible than raw soyabean protein.
   3) Green gram is germinated while it is used in low cost weaning foods.
   4) Saponins, anti-nutritional factor in groundnut, is destroyed by application of heat.
   5) Food grade benzene is used in production edible grade defatted soya flour.

Q.10 State reasons for followings.
   1) Aqueous alcoholic extraction of oilseed meal causes increase in protein content.
   2) Dehusking of soyabean is carried out in the preparation of edible grade soya meal.
   3) Soaking and germination of legumes causes reduction in flatulence.
   4) Addition of oilseed protein in biscuit causes increase in biscuit hardness.
   5) Fermentation of legumes causes increased nutritive value.
SECTION "A"

Q.1 What is neutralization of oil? Describe the factors influencing batch neutralization.

Q.2 Write the requirement of bleaching to oil and applications of bleaching materials on the quality of oil.

Q.3 Describe the factors influencing extraction of oils.

Q.4 What are the important operations carried out frequently by oil seed processing industries.

Q.5 What are the oils and oilseeds used for edible and non-edible oils in India?

Q.6 Describe the physico chemical properties of oils & fats.

Q.7 Write short notes on the following.
   1) Hydrogenation of oil
   2) Sterols

SECTION "B"

Q.8 Define the followings (Any Two)
   1) Margarine
   2) Antioxidant
   3) Degumming of oil

Q.9 Give reason.
   1) Vegetable oils remain liquid at room temperature.
   2) Salad oils do not become cloudy when kept in refrigerators.
   3) Soybeans are flaked before oil extraction.
   4) Heating of oilseeds prior to extraction of oil improves the efficiency of extraction.
   5) The seed meat requires desolventization after solvent extraction.

Q.10 State True or False.
   1) In India most of the solvent extracted oils is used for industrial purpose.
   2) Every type of oilseeds behaves similarly during the extraction processes.
   3) Oiler extractor is of percolation type.
   4) Activated Charcoals are used for degumming of oil.
   5) Catalysts are used for deodorization of oil.

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