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**St Aloysius College (Autonomous)  
Mangaluru**

**Semester II – P.G. Examination – M.Sc. Food Science and Technology  
April- 2019**

**FOOD PROCESS ENGINEERING AND INSTRUMENTATION**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following. (6x3=18)**

1. Write a note on SI units.
2. Briefly discuss about water activity and its significance.
3. Enumerate on application of transport phenomena in food process engineering.
4. Mention the factors influencing heat and mass transfer.
5. Write the principle involved in operation of spectrometer?
6. Define One Newton. Convert One Watt and One Joule to their respective basic units.
7. Write a note on Electronic Nose.

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**II Answer any FOUR of the following. (4x7=28)**

8. Discuss in detail about any two unit operations used in food industry.
9. Discuss mechanical properties of food.
10. Explain the flow properties of liquid foods, pulps and slurries.
11. Briefly explain the working principle for BABCOCK and WILCOX boiler.
12. Write a detailed note on Electronic Nose.

**III Answer any TWO of the following. (2 x12=24)**

13. With a neat schematic diagram explain the principle and working of an Extruder.
14. Discuss in detail about HPLC, mentioning its application in food industry.
15. What is rheology? Explain how rheological principles are used in food industry.  
Add a note on flow properties of food.

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**St Aloysius College (Autonomous)  
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**Semester II – P.G. Examination – M.Sc. Food Science and Technology  
April - 2019**

**TECHNOLOGY OF CEREALS, LEGUMES & OIL SEEDS**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following: (6x3=18)**

1. What is parboiling of rice? Write the disadvantages of parboiling.
2. Give the structure and chemical composition of wheat?
3. Write a note on anti nutritional factors.
4. List out the changes during baking of biscuits.
5. Write short note on composition of edible oils.
6. Write a short note on oat mill products.
7. Name different types of corn. Briefly mention the extraction of High fructose corn syrup.

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**II Answer any FOUR of the following: (4x7=28)**

8. Write a short note on rice milling.
9. Explain refining process in oil.
10. What are leavening agents? What are their applications in food?
11. Elaborate on the processing of oats.
12. Discuss on various flour grades and types.

**III Answer any TWO of the following: (2 x12=24)**

13. Explain on wheat milling.
14. Discuss in detail about methods of measuring dough rheology.
15. Discuss the changes during storage of fats and oils.

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**St Aloysius College (Autonomous)**  
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**Semester II - P.G. Examination - M.Sc. Food Science and Technology**  
**April- 2019**  
**TECHNOLOGY OF FRUITS AND VEGETABLES PRODUCTS**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following: (6x3=18)**

1. Mention different edible coatings for fruits.
2. What are climatic and non climatic fruits?
3. What are the different pre storage treatments for fruits and vegetables?
4. What is minimal processing?
5. What are the enzymes used for clarification of fruits juices.
6. Difference between Jam and Jelly.
7. Define value added fruit products with examples.

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**II Answer any FOUR of the following: (4x7=28)**

8. What is FPO and explain its salient features.
9. Write about hypobaric storage of fruits and vegetables.
10. Difference between RTS , RTD, and RTE
11. Explain canning process of fruits and vegetables and their importance.
12. Discuss on processing of fruit juice concentrates.

**III Answer any TWO of the following: (2 x12=24)**

13. Explain in detail the biochemical changes and their importance in fruit processing.
14. Explain Modified Atmospheric Packaging (MAP).
15. Discuss the production of mushroom and its processed products.

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### St Aloysius College (Autonomous) Mangaluru

Semester II – P.G. Examination – M.Sc. Food Science and Technology  
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#### RESEARCH METHODOLOGY

Time: 3 Hours

Max. Marks: 70

I Answer any **SIX** of the following. (6x3=18)

1. Define Research and list the types of research.
2. What are Standard error, sampling errors and population?
3. Principles of Experimental designs.
4. What are good and poor literature surveys?
5. Find the arithmetic mean and median for the following:  
63, 57, 51, 54, 61, 62, 59, 58, 60.
6. Write note on co-efficient of variation.
7. Write a note on binomial distribution.

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II Answer any **FOUR** of the following.

8. Explain primary data and secondary data.
9. Find the standard deviation for the following data regarding daily sales of number of glasses of lemon juice in shop.

No of glasses lemon juices	15	20	30	35	40
No of days	5	0	2	5	2

10. Explain Chi square test for goodness of fit with example.
11. Explain Research process in detail.
12. Explain the types of probability and non probability samplings in research.

III Answer any **TWO** of the following. (2 x12=24)

13. What is ANOVA? Discuss in detail.
14. Explain the regression and find the regression equation of X and Y and predict the value of X when Y is 9.

X	3	6	5	4	4	6	7	5
Y	3	2	3	5	3	6	6	4

15. The Probability that the bomb dropped on a bridge hits is 0.4. Eight bombs are dropped on the bridge. Two bombs-hits are enough to destroy the bridge. Find the Probability that;
  - i) All the bombs hit the bridge
  - ii) Two bombs hit the bridge
  - iii) The bridge is destroyed

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**FOOD PROCESS ENGINEERING AND INSTRUMENTATION**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following:****(6x3=18)**

1. Discuss on different thermal properties of food.
2. Short note on Newtonian fluids.
3. Explain the working of a boiler.
4. Write short note on Mechanism of heat transfer.
5. Discuss the principle of UV Spectrophotometer.
6. Write short note on sensory attributes.
7. Describe the properties of steam.

**II Answer any FOUR of the following:****(4x7=28)**

8. Conversions using conversion factors:
  - a. Foot to meter : Convert 10 foot into meter
  - b. A milk van is moving at a speed of 80 Km/h convert it to m/s.
9. Explain principle of Gas chromatography and types of detectors used in Gas Chromatography.
10. Symbolically represent the following quantities with proper Units and Dimensions :  
Area; Density; Velocity; Energy; Pressure; Force ; Speed; Volume; temperature and mass.
11. Explain different types of sensory testing methods.
12. Discuss briefly the working of Extrusion equipment. -

**III Answer any TWO of the following:****(2 x12=24)**

13. Discuss the various unit operations in a food industry with at least two operations in detail.
14. Explain in detail the working of an electronic nose and electronic tongue and explain how it will help the food industry to ease its workload.
15. Discuss in detail how cold sterilization of food is carried out in a food industry.

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**Semester II – P.G. Examination – M.Sc. Food Science and Technology**  
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**TECHNOLOGY OF CEREALS, LEGUMES AND OILSEEDS**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following:****(6x3=18)**

1. Enumerate on any four functional properties of oilseed proteins.
2. Why are cereals known as staple crops?
3. What are the cooking characteristics of rice?
4. What are protein concentrates and isolates?
5. What changes occur during storage of oilseeds?
6. What is dough extensibility? Why it is an important property of dough?
7. Differentiate between wet and dry milling of corn.

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**II Answer any FOUR of the following:****(4x7=28)**

8. Explain on the nutritional composition of pulse. Add a flow chart on the processing of pulses.
9. List the advantages and disadvantages of parboiling of rice.
10. Explain in detail the process of malting.
11. Explain the preparation of High Fructose Corn Syrup
12. What are the various flour grades and types? Add a note on flour improvers and bleaching agent.

**III Answer any TWO of the following:****(2 x12=24)**

13. Explain the technology in processing of Soya bean.
14. Give the structure and composition of rice. Add a note on its milling, and the use of rubber roller huskers in rice milling.
15. Discuss briefly the steps involved in bread making.

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**TECHNOLOGY OF FRUITS AND VEGETABLES PRODUCTS**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following:****(6x3=18)**

1. What are Climacteric and non-Climacteric fruits
2. Explain hypobaric storage.
3. What are the precaution measures taken during harvesting.
4. What are value added products of fruits and vegetables?
5. Explain enzymatic clarification of juices.
6. What are biochemical changes during ripening?
7. Write short note on processed mushroom?

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**II Answer any FOUR of the following:****(4x7=28)**

8. Discuss the quality control of fruit juice and beverages.
9. Explain physical and chemical indices of fruit maturity.
10. Write in detailed spoilage of fruits and vegetables.
11. Describe role of pectin in fruit processing.
12. Describe technology in processing of tomato products.

**III Answer any TWO of the following:****(2 x12=24)**

13. Explain different methods in storage of fruits and vegetables and their advantages and disadvantages.
14. Explain application of MAP in preservation of fruits and vegetables.
15. Elaborate on various techniques involved in the preparation of fruit juice.

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**RESEARCH METHODOLOGY**

Time: 3 Hours

Max. Marks: 70

**I Answer any SIX of the following: (6x3=18)**

1. Distinguish between systematic and stratified sampling.
2. Write a note on need of data sampling.
3. What are the prerequisites of data to perform chi square Test.
4. What motivates people to undertake research?
5. What is ANOVA and why it is important?
6. Write the difference between discrete and continuous data.
7. Name two internet search engines employed for doing literature survey.

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**II Answer any FOUR of the following: (4x7=28)**

8. Discuss any two Research methods and techniques involved in research methodology.
9. Explain importance of applied research in the context of technology development.
10. List out the important points to be observed by a researcher in selecting a research problem.
11. Determine measures of central tendency, range and variance for the following data set.  
3 4 9 15 18 20 25 19 12 25 29 42
12. Define variable and mention types of variables with examples.

**III Answer any TWO of the following: (2 x12=24)**

13. Write on importance of fundamental research. Name three important subject area of research for which Nobel prize is awarded?
14. Determine standard error for the given data in table, standard deviation and co-efficient of variation for the observed (microbial activity) data set.

Amount of Compound(mg)	1	2	4	8	16	32	64
Microbial Activity (%) Observed	3	5	11	22	42	74	129
Microbial Activity (%) Actual	4	6	12	20	40	80	120

15. Discuss on Probability distribution.

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