

EX/PG/FTBE/T/ 111A /2018

M.TECH. FOOD TECHNOLOGY & BIOCHEMICAL ENGINEERING
First Year-First Semester EXAMINATIONS, /2018

ADVANCED FOOD TECHNOLOGY

Time: Three hours

Full Marks: 100

PART-I (50 Marks)

Answer any Three questions. All questions carry equal marks

1. With a flow sheet, describe the technology logistics to be implemented in fruit juice and pulp processing.
2. Discuss the types of filtration units usually used in food industry.
3. Discuss the applications of edible coatings as support of active ingredients for improving quality and extending shelf life of fresh cut fruits.
4. Discuss the types of applications of enzymes in fruit juices production. What is called pectinase activity?
5. What is the role of particles in food processing industries?
6. Write short notes : (Any three)
 - a.) Front -End Operation --Reception Line
 - b.) Final Grading and Inspection and Sorting
 - c.) Mango Leather
 - d.) Solar Drying-Cabinet Drying, and Tunnel Drying

M.TECH (FTBE) FIRST YEAR, FIRST SEMESTER 2018

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PART - II (50 MARKS)

Answer Q1 and any Two from the rest

- Q1. a. Which signals generated due to interaction between high energy electrons and specimens are utilized in designing a scanning electron microscope? Comparatively evaluate TEM and SEM analyses of a protein-rich food of your choice. 4 + 4
- b. Discuss the phytochemical attributes of 'asparagus' that qualifies it to be a good source of antioxidants. What processing would you recommend to retain the same? 3 + 3
- c. In formulation of 'cocoa butter substitute fat', enumerate the roles of the three product development methods - 'application development', 'analytical development' and 'triglyceride replication'. 6
- Q2. a. What properties of supercritical carbon dioxide make it amenable for extraction of nutraceuticals? With the aid of a schematic diagram, enumerate supercritical carbon dioxide extraction of antioxidants from broccoli (heads). Suggest an alternate solvent (mixture) for extraction of the antioxidants in compliance with principles of green chemistry. 3 + 5 + 1
- b. Why is it necessary to modify the conventional chemical fixation methods for 'processed' food samples? Explain with two examples. 4
- c. Why is MAP preferred over CAP for post-harvest preservation of phytochemical properties of cauliflower? 2
- Q3. a. Why are green extraction technologies preferred over classical extractions in designing nutraceutical food supplements? 3

- b. Explain the working principle of detectors used for elemental analyses of food samples. 5
- c. Provide processing guidelines for minimally processed 'cabbage shreds'. Enumerate the role of proteases in MP vegetables. 5 + 2

Q4. a. What is a fractal? Explain the methodology for estimating fractal dimension of broccoli. Give two examples of application of fractal analyses in food engineering. 1 + 4 + 2

b. What is an electron gun? What are TEM grids? Why is thin sectioning required for TEM analyses? 2 + 1 + 2

c. Which browning inhibitors would you recommend for minimally processed fruit salad and why? 3

Q5. a. Enumerate a localization technique for proteins using SEM with an example. 5

b. Describe the technique you would adopt to study distribution of fat in a food sample? 5

c. How does washing of green bell pepper in 'minimal processing' differ from that for 'tray drying'? 5