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PG/ 2<sup>nd</sup> Semester/PFET202

2024

**Emerging Food Processing Technology-II: Oils, Fats, Bakery & Confectionary**

Full Marks: 100

Time: Three hours

*The figures in the margin indicate full marks for the questions.*

*Attempt any five questions from the following*

5x20

1. a) Describe the chemical reaction involved during hydrolysis of triglyceride present in palm oil. 3
- b) Why vegetable oil is more shelf stable than animal fat? 2
- c) Represent the structures of DHA and EPA and indicate its omega characteristic. 4
- d) Mention the reaction between linolenic acid and iodine. 3
- e) Describe the mechanism of action of antioxidants for the prevention of autooxidation of lipid. Indicate two examples of permitted synthetic oxidant with structure. 5+3
2. a) State the importance of the R-M value and the iodine number. Cite one example of an emulsifier and metal chelator. 3+2
- b) Explain with reaction how many hydrogen atoms are required to hydrogenate GLA. 3
- c) Explain saponification with chemical reaction. Describe hydrolytic rancidity with chemical reaction. 3+3
- d) Explain polymorphism? What is SFI? Give few examples of natural antioxidants available in RBO. 2+2+2
3. a) Describe the nutraceutical properties of edible oil. What do you understand by fatty acid balance? 3+2
- b) Describe the pressing method of extraction of edible oil from oilseed. Why it is called cold extraction process? How coconut oil is extracted? 3+1+3
- c) Differentiate between single bleached and double bleached lecithin. Give one example each of hydratable and nonhydratable phosphatide. What is miscella? 2+2+1
- d) Describe the enzymatic degumming process? 3

4. a) Differentiate between dewaxing and winterization? 2
- b) Describe the process of continuous deodorization with a design of double shell deodorizer. Mention only the time-temperature relationship in deodorization process. Give the composition of deodorizer distillate with respect to soybean oil. 5+2+1
- c) What is miscella refining? What is once refined oil? What is treat? 1+1+1
- d) Discuss interesterification of lipid. Discuss bleaching conditions in continuous operation? 4+3
5. a) What is cocoa butter? Give a detailed description of cocoa butter alternative (CBA). 1+3
- b) How butter is manufactured? Differentiate between hard butter and butter. Give the name and structure of flavour producing compound in butter. 3+3+2
- c) Describe the role of major ingredients in biscuit manufacturing. 5
- d) What is gluten and what is its function? 3
6. a) Mention the list of physicochemical tests performed in the quality evaluation of wheat flour. How can you determine the gluten content of wheat flour? 2+6
- b) How dough strength is measured in bakery industry? Elaborate one suitable method. 2+4
- c) Describe various types of mixers employed in the bakery industry. 6 4
7. a) Briefly describe the production of confectionery gum with its composition. 4
- b) Explain the confectionery moulder with a suitable diagram. 5
- c) Discuss various processing operations involved in confectionery production. 5
- d) Describe briefly a widely used continuous oven in biscuit manufacturing with diagram. 6