53 (FPT 304) FCAN

2017

FOOD CHEMISTRY AND NUTRITION

Paper : FPT 304

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions from **seven**.*

1. *(a)* What is water activity in food ? What does water activity measure and how is it related to food spoilage ? 5

   (b) Explain glycosidic linkage with the example of sucrose. 3

   (c) What is Covalent Bond ? Why is maltose a reducing sugar ? 4

   (d) What is *S-S* bridge ? Explain the tertiary level of protein structure. 4

(e) Define Hydrogenation. How does the process of hydrogenation work? 4

2. (a) "Amino acid shows amphoteric behaviour". Explain. 3

(b) Define Epimers, Enantiomers, Anomers and Diastereomers. 2×4

(c) Explain the process of Saponification. Is saponification reaction exothermic or endothermic? 4

(d) What is an antioxidant and why is it important? Which vitamins and minerals are antioxidants? 5

3. (a) What is amino acid residue? Why some amino acids are hydrophilic? 4

(b) Draw molecular diagrams of glycerol, glucose, ribose, a saturated fatty acid and a generalized amino acid. 5

(c) What are Fatty Acids? Give *two* important properties of fatty acids. 3

(d) Define Hydrolysis. Show the removal of water from a molecule of glycerol and three fatty acid molecules results in the formation of triglyceride. 4

(e) What is Isomer? Draw the Haworth projection of the structures for α-D-Glucopyranose and β-D-Glucopyranose. 4

4. (a) What is Nutritional Assessment? What is the purpose of a nutritional assessment? 4

(b) Define MUFA. Give examples. 3

(c) Define the following terms : 2×5

(i) Phospholipids

(ii) HMF

(iii) Monohydric alcohol

(iv) Glycogen

(v) Ionic bond.

(d) Explain Caramelization and its consequences. 3

5. *(a)* Write the molecular formula of the following fatty acids : 1×5

(i) Palmitic acid

(ii) Stearic acid

(iii) Oleic acid

(iv) Butyric acid

(v) Palmitoleic acid.

(b) What is a nutritional deficiency disease? How do you prevent malnutrition? 4

(c) What are synthetic flavouring agents? Give examples. 3

(d) Write the structure and function of amylose and amylopectin. 4

(e) What are R-groups? What is the difference between alpha-helix and beta-sheet protein conformations? 4

6. *(a)* Distinguish between : 3×4

(i) Sugar and Non-sugar

(ii) Acidic and basic amino acids

(iii) Artificial and Natural flavouring

(iv) Cis and trans fat.

(b) List and explain the two ways in which fats are deteriorated and become rancid. 4

(c) Explain PUFA, SCFA, MCFA and LCFA. 4

7. (a) Write short notes on : ***(any four)*** 4×4

(i) Maillard reaction

(ii) Quaternary structure of protein

(iii) Provitamin

(iv) Moisture sorption isotherm

(v) Strecker aldehyde

(vi) BMR.

(b) What is Free Water? List the *two* characteristics of bound water. 2

(c) Explain EFA giving examples. 2