

Total number of printed pages-5

53 (FPT 304) FCAN

2014

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 5 (five) questions from 7 (seven).

1. (a) Define Simple Sugar. Give example of one carbohydrate that contains only one sugar unit. 2
- (b) What is Water Activity ? Explain the relation between water content and water activity. 3
- (c) What is pro-vitamins ? Write the chemical names for vitamin A, E, B₂ and K. 2+4
- (d) Explain hydrogenation and its effect on shelf life of fat/oil. 4

Contd.

(e) What is Disulphide bond? Explain the tertiary structure of protein. 1+4

2. (a) The molecular formula for glucose is $C_6H_{12}O_6$. What would be the molecular formula for a polymer made by linking ten glucose molecules together by dehydration synthesis? 2

(b) What is Emulsifying agent? Explain in detail the formation of an emulsion. 2+3

(c) What is fructans? Draw the Haworth-Projection of Alpha-D-glucofuranose. 3

(d) Explain in brief the importance of food colorants. 4

(e) Show the formation of hemiacetal. 3

(f) Differentiate between Free water and Bound water. 3

3. (a) Define the following terms: 2×5

(i) Gels (ii) C-terminal (iii) Albumin
(iv) Dextran (v) Zwitterion.

- (b) What are amino acids considered as amphoteric compounds? 3
- (c) What is Polypeptide? Show the formation of a dipeptide bond. 4
- (d) Define Acidity and Rancidity. 2
- (e) What kind of sugars are found in the disaccharide sucrose? 1
4. (a) Explain the solubility of lipids. 3
- (b) Write the chemical formula for : 5
- (i) Ribose (ii) Glyceraldehyde (iii) Ketal
(iv) Stearic acid (v) Fructose.
- (c) Explain the importance of essential amino acid. 3
- (d) Explain EFA, PUFA and MUFA. 2+2+2
- (e) What is conjugated protein? Give examples. 3
5. (a) Draw the general structure of amino acid and list all the non-essential amino acids. 4

- (b) Differentiate between : 3×2
- (i) Sugar and Non-sugar
 - (ii) Fat soluble and water soluble vitamins.
- (c) Explain in brief the high fiber diet. 4
- (d) What is denaturation of protein ? 2
- (e) Explain Caramelization and its consequences. 3
- (f) What amino acid possesses the simplest R-group ? 1
6. (a) What is Antioxidant ? Explain vitamins as antioxidant. 5
- (b) Give *one* example each of cis and trans bonds Fatty acid. 2
- (c) What is Flavourants ? Distinguish between natural and artificial flavouring substances. 4
- (d) What are Oligosaccharides ? Give examples. 4

- (e) Differentiate between reducing and non-reducing sugar. 4
- (f) What is Melanoidin? 1
7. (a) Write brief notes on : (*any three*) 4×3
- (i) Strecker aldehyde
 - (ii) Secondary structure of protein
 - (iii) BMR
 - (iv) Dietary fiber
 - (v) Triglycerides.
- (b) Differentiate between solvation and solubility. 2
- (c) What is SCFA? Give example. 2
- (d) Define hydrophobic and hydrophilic bond. 2
- (e) What *three* minerals have to be on the nutrition facts panel of the food label? 2