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**St Aloysius College (Autonomous)
Mangaluru**

**Semester I – P.G. Examination – M.Sc. Food Science, Nutrition and Dietetics
January -2023**

FOOD CHEMISTRY

Time: 3 Hours

Max. Marks: 70

I. Answer any SIX of the following**(6×3=18)**

1. What is proximate analysis? Why it is important in food analysis.
2. Define water activity and how it relates to vapor pressure?
3. What is resistant starch? Make a note on the different types of resistant starch?
4. What is rancidity? How it affects the quality of lipids?
5. Define anti-nutritional compounds with an example.
6. What are dietary fibers? Mention their dietary significance.
7. How vitamins act as enzyme cofactors? Justify with examples.

II. Answer any FOUR of the following**(4×7=28)**

8. Discuss the physico chemical properties of water that makes it a solvent of life.
9. What is starch? Discuss on the functionalities (gelatinization & retrogradation) of starch.
10. Discuss the hydrogenation and winterization process of fats and oils with applications.
11. Describe the denaturation process of proteins and gel formation. How it impacts processing and storage of food proteins.
12. What is an enzyme catalyzed reaction? Explain the enzyme utilization in food industries.

III. Answer any TWO of the following**(2×12=24)**

13. What is browning in food? Elaborate on enzymatic and non-enzymatic browning and its applications in food.
14. Explain the sources and nutritional classification of proteins. Add on the digestibility coefficient, biological value, NPU and PER for food proteins.
15. Enumerate the chemical classification of lipids and describe the nutritional aspects of natural and modified lipids with dietary significance.

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Semester I – P.G. Examination – M.Sc. Food Science Nutrition and Dietetics

January -2023

PRINCIPLES OF FOOD PROCESSING AND PRESERVATION

Time: 3 Hours

Max. Marks: 70

I. Answer any SIX of the following (6×3=18)

1. Write a short on movement of moisture during drying.
2. Write a short note on pasteurization.
3. Write the different types of blanching.
4. Write the processing methods of IMF
5. What are the desirable refrigerant properties?
6. Write a short note on ohmic heating application.
7. Write a short note on microwave processing mechanism

II. Answer any FOUR of the following (4×7=28)

8. Explain the types of Separation methods.
9. Explain the methods of thermal drying.
10. Elaborate on chilling equipment and application of cold storage on fresh and processed foods.
11. Elaborate on canning process and its microbial spoilage.
12. Write the classification of preservatives and explain its mode of action.

III. Answer any TWO of the following (2×12=24)

13. Discuss in detail the conventional preservation methods used for preservation of food.
14. Discuss in detail about Hurdle technology and its applications in food industry.
15. Discuss in detail about the phenomena of ice crystal formation in freezing and freezing curves.

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**Semester I – P.G. Examination – M.Sc. Food Science Nutrition and Dietetics
January -2023**

HUMAN NUTRITION

Time: 3 Hours

Max. Marks: 70

I. Answer any SIX of the following (6×3=18)

1. Glycemic index and Glycemic load
2. Sugar substitutes
3. Define Energy Balance, BMR and RMR
4. Resistant starch
5. Metabolic flow of food energy in humans.
6. RDA and its applications.
7. Differentiate between types of dietary lipids.

II. Answer any FOUR of the following (4×7=28)

8. Explain clinical features of PEM with metabolic changes.
9. Discuss on the role of dietary lipids in disease manifestations.
10. Briefly discuss the methods of protein quality evaluation.
11. Write about basis for computing nutrient requirements and add a note on latest concepts in dietary recommendation.
12. Explain the components of energy expenditure.

III. Answer any TWO of the following (2×12=24)

13. Review in detail the metabolism of proteins.
14. Discuss lipids based on the following:
 - A) Absorption and transport
 - B) Synthesis
15. Write a note on carbohydrate on the following
 - A) Functions and sources
 - B) Metabolism and its disorders

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Semester I – P.G. Examination – M.Sc. Food Science Nutrition and Dietetics

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HUMAN PHYSIOLOGY

Time: 3 Hours

Max. Marks: 70

I. Answer any SIX of the following

(6×3=18)

1. Define intercellular communication and list its types
2. Write the role of aquaporins
3. List down the functions of neuron
4. Write a note on formation and composition of blood.
5. What is the role of synapses and neurotransmitters.
6. What are the types of muscles and write their functions?
7. Write the functions of thyroid gland and islets of Langerhans cells.

II. Answer any FOUR of the following

(4×7=28)

8. Elaborate on function and dysfunction of liver.
9. Discuss the regulation of food intake with respect to hunger and satiety.
10. Explain the role of skin in maintaining homeostasis.
11. How does the regulation of cell multiplication happen?
12. Explain the role of lungs in exchange of gases.

III. Answer any TWO of the following

(2×12=24)

13. With a neat labelled diagram, explain the structure and function of skeletal bone and cartilage.
14. With a neat labelled diagram, explain the structure and function of heart and blood vessels.
15. Draw a neat labeled diagram of nephron and explain the mechanism of urine formation.

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ESSENTIALS OF MICRONUTRIENTS

Time: 3 Hours

Max. Marks: 70

I. Answer any SIX of the following (6×3=18)

1. Write the role of insulin and aldosterone in the cellular regulation of potassium.
2. Write a note on antioxidant role of Vitamin E
3. Mention the Role of B1, B2, B6 and Niacin as co-enzymes in the pyruvate dehydrogenase complex
4. Write a short note on Acrodermatitis Enteropathica
5. Write a short note on Iron Deficiency Anemia.
6. Write a short note on disorders of water balance
7. Write a short note on hypophosphatemia.

II. Answer any FOUR of the following (4×7=28)

8. Explain the metabolism of calcium in detail.
9. Explain in detail about renal regulation of sodium with RAA and HPA axis.
10. Detail out the:
 - a. Role of Vitamin C in collagen synthesis
 - b. Assessment of B6 status
 - c. Interaction of Vitamin D with other nutrients.
11. Explain the physiological functions of electrolytes.
12. Explain the metabolism of iron in the enterocyte and hepatocyte.

III. Answer any TWO of the following (2×12=24)

13. Discuss the following:
 - a. Deficiency of thiamine
 - b. Metabolism of B12
 - c. Folate metabolic functions
14. Elaborate on the metabolic functions of vitamin A and Vitamin K.
15. Elaborate on the metabolism of:
 - a. Selenium in enterocyte
 - b. Iodine in thyroid gland
