INSTRUCTIONS TO CANDIDATES:
1. Answer all the questions in the examination answer book provided.
2. Questions may be answered in any order, but subsections of questions must be answered together.
3. Marks will be deducted for untidy and illegible handwriting.
4. Good luck!

QUESTION 1

1.1 Distinguish between primary, secondary, tertiary and quaternary structure of proteins. (8)

1.2 Define or explain each of the following terms associated with the protein functionality in food systems.
   (a) Solubility (5)
   (b) Gelation (7)

1.3 Describe in details the different processing steps involved in production of gelatin. Include a description of each step on the flow diagram and describe the importance of each step in the manufacturing process. (12)

QUESTION 2

2.1 Briefly describe the role of lipids in the sensory quality of meat and meat products. (10)

2.2 Chemical indices are a measure of several specific chemical properties of lipids. Define the following chemical indices and explain their importance in the fats and oils industry.
   (a) Acid value (2)
   (b) Iodine value (2)
   (c) Peroxide value (2)

2.3 Oil extraction is an important step during vegetable oil production. State the common methods used in fats and oils industry for oil extraction and briefly describe the criteria for selecting an ideal solvent for the extraction of oil from oil seeds. (10)
QUESTION 3
3.1 Discuss the influence of temperature, acid treatment and addition of sugar on starch gelatinisation. (10)
3.2 During the manufacture of a certain jam, you will use a high methoxyl pectin. Discuss the properties, advantages of this type of pectin (10)

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QUESTION 4
4.1 Briefly discuss how each of the following functional food components exerts health benefits:
   a) Antioxidants with reference to phytochemicals e.g. flavonoids (11)
   b) Dietary fibers (Soluble and insoluble fibers) (11)
   a) Probiotics e.g. Lactobacillus and Bifidobacterium species (11)

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QUESTION 5
5.1 Define / explain each of the following terms:
   a) Rheology (3)
   b) Viscosity (4)
5.2 Fluids that follow Newton’s law of viscosity are called Newtonian fluids whereas those that do not follow Newton’s law of viscosity are known as non-Newtonian fluids. With examples and use of rheograms describe pseudoplastic flow and dilatant flow. (15)

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QUESTION 6

6.1 List the advantages of High pressure processing (HPP) over conventional thermal processing technologies. (7)

6.2 Discuss the factors that influence the efficacy of HHP to ensure microbial food safety. (20)

QUESTION 7

7.1 Describe the time–temperature data curve during freezing. (15)

7.2 Describe how re-crystallisation, freeze burn and drip loss affects the quality of frozen foods. (10)