



**PROGRAM** : B TECH  
*FOOD TECHNOLOGY*

**SUBJECT** : **FOOD COMPONENTS 4**

**CODE** : **FTN1AC4**

**DATE** : SUPPLEMENTARY EXAMINATION  
JULY 2018

**DURATION** : (X-PAPER) 3 HOURS

**WEIGHT** : 50 : 50

**TOTAL MARKS** : 183 (180 = 100%)

---

**EXAMINER** : DR S DE KOCK Sanso Number

**MODERATOR** : DR G LOMBARD File Number

**NUMBER OF PAGES** : 4 PAGES

---

**REQUIREMENTS** : 2 ANSWER SHEETS PER STUDENT.

---

**INSTRUCTIONS:****ANSWER ALL QUESTIONS**

**QUESTIONS MAY BE ANSWERED IN ANY ORDER, BUT SUB-SECTIONS OF QUESTIONS MUST BE ANSWERED TOGETHER**

---

**QUESTION 1**

State whether the following statements are true or false **AND** motivate your answer every time.

- 1.1 Desorption and adsorption curves lie exactly on top of one another.
- 1.2 Sorghum starch has a higher gelatinisation temperature than potato starch.
- 1.3 The presence of proteins in an acidic starch medium, will cause interference with the viscosity.
- 1.4 Waxy starch is a good choice of starch when a gel is required in a food product.
- 1.5 Potato starch can be used to thicken mayonnaise.
- 1.6 Propylene glycol alginate can be used at a low pH without it precipitating.
- 1.7 Temperatures over 65°C will denature caseins.
- 1.8 Shellfish analogues are called sushi.
- 1.9 Salad oils are chemically stable in have an indefinite shelf-life.
- 1.10 Myofibrillar proteins are examples of stroma proteins.

[15]

---

**QUESTION 2**

- 2.1 Discuss the principles and production techniques of manufacturing intermediate moisture foods (IMF's). (6)
- 2.2 Draw a graph illustrating the relationship between water activity and: a) browning, b) oxidation and c) microbial activity. (6)

[12]

---

**QUESTION 3**

- 3.1 You are employed at a starch manufacturing company. Food processors have contacted you with the following problems/phenomena. Explain to them why these problems/phenomena have occurred and suggest what they can do to overcome it (NB: make use of graphs to illustrate your answer).
  - a) A manufacturer which uses potato starch as a thickener for his ready-to-eat chicken ala-king, cooks the product up to 90°C, which provides the desired viscosity. However, he found that when there is a hold-up in the line before packaging, the product becomes very thin. (6)
  - b) A manufacturer of mayonnaise uses ordinary waxy sorghum starch as a thickener, but found that its thickening capacity is unsatisfactory. (6)

- 
- c) A fruit pie thickened with corn (maize) starch has a dull unappetising appearance. (4)
- d) A frozen sauce thickened with corn (maize) starch shows syneresis after defrosting. (5)
- 3.2 Name 3 types of modified starch. Explain how it is manufactured, as well as its properties and applications. (12)
- 3.3 List 5 factors which will affect starch gelatinization. (5)
- [38]**
- 

#### **QUESTION 4**

- 4.1 Discuss locust bean gum and guar gum as two of the gums used in the food industry with regards to structure, properties and applications. (12)
- 4.2 Describe xanthan gum with regards to structure, properties and applications. (9)
- 4.3 Illustrate with a graph what will happen to the viscosity of Newtonian, shear thinning and shear thickening products, if shear is applied. Also give one food example of each of the type of products. (6)
- [27]**
- 

#### **QUESTION 5**

- 5.1 Write notes on fructose as a sweetener in the food industry. (7)
- 5.2 Describe the structure properties and applications of the following non-nutritive sweeteners.
- 5.2.1 Aspartame (5)
- 5.2.2 Alitame (5)
- 5.3 Name three ways in which corn syrups can be produced. (3)
- [20]**
- 

#### **QUESTION 6**

- 6.1 Native proteins can be modified to optimise its functional properties. Describe the following physical modifications with regards to raw material used, process and properties of end-products:
- 6.1.1 Extrusion
- 6.1.2 Spinning
- 6.1.3 Freeze-alignment (12)
- 6.2 Proteins have a variety of functional properties. Discuss four of them and explain where these properties are utilised in the food industry. (12)

- 
- 6.3 Explain why the use of legume (soya) proteins in food products is limited. (8)  
[32]
- 

**QUESTION 7**

- 7.1 Describe the functions of fat/oil in the following food products and suggest a suitable type of fat/oil for each: (3)
- 7.1.1 Biscuits (cookies) (3)
- 7.1.2 Bread (6)
- 7.2 Explain how and why winterisation is performed on oils. (4)
- 7.3 Fat substitutes can be divided into 4 categories based on the food component from which they are derived. List these 4 categories, give 2 examples as well as 1 function of each of the categories. (12)  
[25]
- 

**QUESTION 8**

Suggest a food ingredient to achieve the following and motivate your answer:

- 8.1 Get a high loaf volume in a low GI bread (3)
- 8.2 Give dehydrated mashed potatoes a fluffy consistency (3)
- 8.3 Production of cheap vegan jelly babies (3)
- 8.4 Thickening a sauce with a low pH (3)
- 8.5 Thickening a pudding to which cold milk is added (2)  
[14]
- 

**TOTAL 183 (180=100%)**