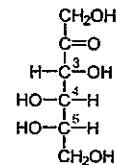


※ 注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

[Part A] 40%

1. The following diagram is the Fisher projection of a sugar. (6%, 2% each)

- (1) Please give the name of the sugar.
- (2) How many chiral carbons does it have? Please circle the carbons.
- (3) How many optical isomers does it have?



2. Compare and contrast locust bean gum and guar gum as botanical source, monosaccharide composition, structure, and food uses. Are these gums totally interchangeable? For what applications might one gum be used for which the other is unacceptable? (8%)

3. Define and/or identify; providing the chemical structures are preferred. (12%, 3% each)

- (a) Raffinose and Stachyose
- (b) Polydispersity vs Polymolecularity
- (c) Kestose vs Nystose
- (d) Slowly digest starch vs Resistant starch

4. Please give two examples (including ingredients and type of extruder) of foods processed by using the technique of extrusion. List at least 4 factors that affect the extrusion process and the effects on the structure and/or expansion of the finished products. (10%)

5. Please describe the compositions and structures of (a) MFGM (milk fat globular membrane) and (b) casein micelle. How do they stabilize their structures in milk? (4%)

[Part B] 40%

1. What is the difference between a primary and a secondary antioxidant on their antioxidative actions? Give 2 examples in each of two types of antioxidant to illustrate the principle and application. (8%)

2. Matching tests. Match the following compounds (a-e) of fatty acid and their corresponding abbreviations. (10 %).
For example: (f)-(4).

- (a) capric, (b) palmitoleic, (c) myristic, (d) caproic, (e) γ -linolenic, (f) lauric.
(1) 6:0, (2) 8:0, (3) 10:0, (4) 12:0 (5) 14:0, (6) 16:0, (7) 16:1, (8) 18:2 ω -6,
(9) 18:3 ω -3, (10) 18:3 ω -6

3. Make a figure and explain in words regarding the relationship of water activity and relative reaction rate in lipid oxidation in foods. (6%)

4. Describe the following phrases used in food processing. Explain the principle, purpose and technique. (16%, 4% each)

- (1) refining process of an edible oil.
- (2) conching process in chocolate making.
- (3) racking process in the production of wine.
- (4) koji-making process in the production of soy sauce.

[Part C] 20%

1. 以沙拉油和雞蛋製作蛋黃醬(mayonnaise)，是利用蛋黃的何種加工特性？(2%)

- (A)熱凝固性 (B)乳化性 (C)發泡性 (D)溶解性

2. 下列何種食品蛋白質，在營養上因缺乏必需胺基酸，而屬於不完全蛋白質？(2%)

- (A)牛奶蛋白 (B)牛肉蛋白 (C)魚肉蛋白 (D)膠原蛋白

3. 請說明 rennin 做為凝乳酵素使得牛乳成膠為 cheese 的機制為何？(4%)

4. 請說明為何還原劑的加入會降低麵糰的彈性？(3%)

5. 請說明 papain 做為嫩肉劑的機制為何？(3%)

6. 請說明等電點沈澱法的原理？(3%)

7. Proglycinin 為大豆組成中高含量的儲藏性蛋白，具有四級結構。請說明何謂蛋白質四級結構？(3%)