

**[Part A] 50%**

1. Please describe the properties and applications of modified starch listed below. (12%, 3% each)  
 (a) Pregelatinized starch; (b) Cross-linked starch; (c) Thin-boiling starch; (d) Substituted starch.
2. What are the functions/impacts of wheat protein, lipid, pentosane, starch and endogenous  $\beta$ -amylase and arabinoxylanase on wheat flour dough and baking products? (10%)
3. Please briefly define/explain the meaning of the following terms and provide a food example of each. (12%)

Definition	Example
Coagulation	
A foam	
Enzymatic browning	
Maillard reaction	

4. Please briefly define/compare the differences between the following items. (16%, 4% each)
  - (a) Aldoses vs. Ketoses
  - (b) Dry milling vs. Wet milling
  - (c) Baking Soda vs. Baking Powder
  - (d) Glass transition temperature ( $T_g$ ) vs. Melting temperature ( $T_m$ )

**[Part B] 50%**

1. Describe the principle and application of enzymatic interesterification in edible oil processing. (10%)
2. Describe the principle for the microbial inactivation in food with a) high hydrostatic pressure; b) pulsed-light treatment. (10%, 5% each)
3. Describe in words about food shelf life testing and how is the shelf life determined. (10%)
4. Describe in words regarding protein functionality in food systems. (4%)
5. What is Diels-Alder reaction that may occur at deep frying conditions? (4%)
6. Draw the chemical structure that is listed below (12%, 3% each)
  - (a) 6-hydroxyflavone; (b) 6-hydroxyflavanonol; (c) methionine; (d) lactic acid.

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