

## [Part A] 50%

1. It has been realized that the starch in food varying in its digestibility in gastro-intestine after ingestion. Please (1) define the following terms and briefly describe their function and/or characteristics, and (2) provide the source of each type of starch. (12%, 3% each)
  - (a) Slowly digestible starch
  - (b) Type 2 resistant starch
  - (c) Type 3 resistant starch
  - (d) Type 4 resistant starch
2. Please answer the following questions related to the corn refining.
  - (a) Please describe the main steps of corn wet milling. (4%)
  - (b) What are the final products could be obtained from corn wet milling? (2%)
  - (c) How to produce the high fructose corn syrup from corn starch and what enzymes will be used for its production? (4%)
3. Please describe the principle and processes of Asian noodle (e.g. alkaline yellow noodle) and Pasta (e.g. spaghetti) making, respectively (6%). Please compare the flour characteristics/qualities required for making these two types of noodle. (4%)
4. Please draw the chemical structures of following items and compare their properties and/or applications. (18%, 6% each)
  - (a) Aspartame vs. Sucralose
  - (b) Alginate vs. Pectin
  - (c) Anthocyanin vs. Proanthocyanin

## [Part B] 50%

1. What is the process of making brewing soy sauce? Describe in brief about the science of soy sauce manufacturing process. (10%)
2. (a) What is hysteresis in food chemistry? (5%); (b) Describe in brief regarding moisture sorption isotherm characteristics of food products. (10%)
3. To determine the fat content of a semi-moist food by the Soxhlet method, the food was first vacuum oven dried. The moisture of the product was 25%. The fat in the dried food was determined by the Soxhlet method. The fat content of the dried food was 13.5%. Calculate the fat content of the original semi-moist product. (10%)
4. Draw the chemical structure that is listed below. (15%, 3% each)
  - (a) Acetone
  - (b) Acetic acid
  - (c) Potassium hydrogen phthalate
  - (d) Oleic acid
  - (e) Threonine