

**DEPARTMENT OF CHEMISTRY**  
**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**  
**FIRST SEMESTER EXAMINATION 2012/2013 SESSION**

**COURSE CODE: CHM 418**

**UNIT: 2**

**COURSE TITLE: FOOD PROCESSING TECHNOLOGY**

**TIME ALLOWED: 2HOURS**

**INSTRUCTION: ANSWER ANY THREE QUESTIONS**

- 1a. Define the term water activity of food and explain the various methods available for the modification of water activity of food
  - b. Discuss the physicochemical processes which occur during the freezing of fresh sample of tomato puree
  - c. Give the roles of the following in foods:  
(i) Ascorbic acid (ii) Nitrites (iii) Cyanogens (iv) Propanoic acid (v) Benzoic acid
  - d. Draw the structure of gossypol and state its functions in foods
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- 2a. What is pasteurization?
  - b. State the functions of the following in ice cream production  
i. Milk solid not fat ii. Egg yolk
  - c. An ice cream mix has 30% fat and 40% sugar solids and 10% stabilizers. Calculate the highest percent milk solid not fat that should be used in a slow and rapid turnover operation
  - d. Describe in chemical terms how thioglycosides may lead to the production of pungency in foods
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- 3a. Describe briefly three lacquering materials in common use in food canning and explain why lacquering is important in food canning.
  - b. With emphasis on the chemical principles involved, describe how ethanol might be produced from potatoes
  - c. How much alcohol would you expect to produce in a wort containing 50kg of glucose as the only fermentable sugar?
  - d. Why should caution be exercised in the use of epoxides in food system?

- e. State the importance of diethylpyrocarbonate in the food industry and show chemically how it can be converted to urethane?
- 4a. Starting with dihydroxyacetone phosphate, state in chemical terms how a brewer may obtain alcohol from a medium containing yeast.
- b. What chemical treatment would you give a green beer to obtain a higher quality product with good shelf life
- c. Name the chemical constituents of hops that makes them very important in lager beer production
- d. Using chemical equation show how glucose could be converted to glucitol and give the importance of this conversion in the food industry.