



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI - 600 034

B.Sc. DEGREE EXAMINATION - FOOD CHEMISTRY & FOOD PROCESSING

THIRD SEMESTER - NOVEMBER 2013

PP 3808 - INORGANIC, PHYSICAL & CHEM. COMPONENTS OF FOOD

Date : 07/11/2013  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**Part-A**

*Answer all the questions. Each question carries two marks.*

Explain the nature of the binding force involved in the association of water molecules with each other.

Identify the nature of the forces involved in the association of molecules of benzene with each other in liquid benzene.

The vapour pressure of water in an aqueous solution of 0.2 M sucrose is 23.6 torr and the vapour pressure of pure water is 23.8 torr at 25 C. Calculate the activity of water.

Explain the role of sodium in the human body.

What is meant by Recommended Dietary Allowance?

Give the mineral composition of whole milk.

Which of the following compounds should have a higher  $\Delta H$  for combustion to form carbon dioxide and water: a.  $C_2H_6$  b.  $CH_3COOH$ ? Justify.

Define order of a reaction.

Explain the relationship between interfacial tension and adsorption.

Explain the importance of dietary fibre.

**Part-B**

*Answer eight questions. Each question carries five marks.*

Explain the Lowry-Bronsted theory of acids and bases. Using this theory, show that the ammonium ion shows acidic behaviour in aqueous solution.

What is the nature of the damage to a foodstuff due to moisture content? Explain with suitable examples.

Explain Karl -Fischer titration and its uses.

How can the ash content in a food is estimated?

Discuss the role of calcium in the human body. What are the natural sources of calcium?

16. Describe the structure of ice.
17. Distinguish between hydrophilic and hydrophobic interactions with examples.
18. Sketch the sorption isotherm for a typical food product showing hysteresis and explain the isotherm.
19. Explain the relevance of glass transition in food stability.
20. How calcium be estimated by the gravimetric method?
21. Explain coupled reactions with examples.
22. What is the procedure for fibre analysis with reference to sample preparation and gravimetric estimation?

**Part-C**

*Answer four questions. Each question carries ten marks.*

23. Explain surfactants with examples and give their importance in food chemistry. What is the theory of electric double layer and its relevance to understanding sedimentary aggregation and liquid dispersions?
- 24a. Data on  $\Delta H$  of chemical reactions are available at  $25^\circ \text{C}$ . Explain how the  $\Delta H$  of the same reaction may be calculated for  $100^\circ \text{C}$  using thermochemistry.
  - b. What is the significance of the standard redox potential of a redox couple? How is this related to  $\Delta G$  and the feasibility of a chemical reaction? (5+5)
- 25a. What are the chemical and functional properties of nickel and copper in food?
  - b. What are the consequences and benefits of vacuum freezing with reference to the stability of food? (5+5)
- 26a. What are the iron sources used for fortification of food?
  - b. Explain the mineral composition of white bread and cooked white rice. (5+5)
27. Distinguish ionic and covalent compounds in terms of the nature of the interaction and physical properties. Give suitable examples for each.
28. Explain the different types of gels and their applications in food preparation.

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