YISHUN JUNIOR COLLEGE
2008 JC2 PRELIMINARY EXAMINATION

H2 COMPUTING **9754**

PAPER 2 **25 - 08 - 2008**

Monday 0800 - 1030

TOTAL MARKS
100

TIME 2.5 hours

INSTRUCTIONS TO CANDIDATES

Answer **all** the questions.

Begin each question on a fresh sheet of paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

This question paper consists of 4 printed pages.

Yummy Food Services is a large catering company. It provides events catering services for corporate, community and private functions. In addition, it provides daily meal delivery services to workplaces and family units.

1) There are six departments (Finance, Delivery, etc) in Yummy Food Services and these are situated in the main building. The six departments are linked using a LAN.

a) For a LAN, three network topologies are possible:

- ring;
- bus;
- star.

For each of these network topologies, draw a diagram to show how the work stations are connected.
Give one advantage and one disadvantage of each topology. [6]

b) What is a protocol and why is there a need for protocols within a network and among networks? [3]

c) Errors can occur in data transmission. Explain the use of parity checks and check sums in detecting these errors. [4]

2 Yummy Food Services also runs a site on the internet to sell exclusive wines from South Africa. Customers see a catalogue of wine items and can make orders remotely. Payment is normally made by the customers forwarding their credit card details.

a) i) Describe one problem that could arise for both the customer and the caterer using this method of payment. [1]

ii) For the problem mentioned in (ai), describe one method that could be used to overcome it. [1]

b) Orders made by the customers are placed in a serial file. The system analyst wants to sort the file in order of credit card number . Explain how this could be done if the file is too large to fit into the computer's memory. [6]

3 The owner intends to send unsolicited email to improve its business.

a) Describe the essential features of an electronic mail system. [2]

b) Give the advantages and disadvantages of electronic mails as compared with traditional mail and others forms of communication. [4]

c) Explain three different undesirable consequences of spam; one social, one economic and one ethical. [6]

4 The chef keeps her recipes for the various food dishes on a single-table database system. A sample of the data is as follows:

RecipeID	Dish	RecipeIngredients (including quantity)	Preparation Time	Cooking Time	Number of Servings	Cooking Instructions
1	Hummus	250g chickpeas 6 cloves garlic 50 ml lemon juice 340g tahini	20 minutes	2 hours	8	Cook chickpeas until soft. Puree in food processor. Add reminder of ingredients, mix well.
2	Feta Salad	400g tomatoes 250g feta cheese 1 cucumber 50g olives 45ml vinaigrette	15 minutes	none	4	Mix all salad ingredients together. Season with salt and pepper. Dress with vinaigrette.
3	Casserole	500g chickpeas 400g tomatoes 450g potatoes	10 minutes	2 hours	4	Cook chickpeas until nearly soft. Add cubed potatoes and tomatoes. **.....**
: :	: :	: :	: :	: :	: :	: :

The chef's only supplier provides her with a file containing the price list for her ingredients.

FoodItemID	FoodItemName	PackSize	Price
Tom001	Tomatoes	400g	$0.55
Chi002	Chickpeas	250g	$0.75
Cuc003	Cucumber	single	$0.50
:	:	:	:

a) The chef would like to hold her data using a relational database and is told that the entities should be normalised. Why is it desirable that the entities are normalised? [2]

b) Show using standard notation, the entities in the database after normalisation.
For each of the entities, identify the primary key(s). [6]

c) Explain how the entities can be used to list all the ingredients and their required quantity for the dish "Feta Salad". Take note that the pack size of the food item and the associated price should also be displayed. [5]

5) The environment in the kitchen is air-conditioned, humidity controlled and is to be well-lit during the hours that the kitchen is open. A computer controlled system is recommended.

a) State the sensors required. [3]

b) Using pseudocode or otherwise, devise an algorithm for the above system. [8]

6) Yummy Food Services currently has 9 outlets which are located all over the island. The oldest is at Jurong, followed by Ang Mo Kio, Hougang, Tampines, Yishun, Chua Chu Kang, Woodlands, Sengkang and Bukit Timah.

Assume that the first item is the root of the tree and the tree is created by entering the data in the order the outlet was opened.

a) Show how the following data may be stored as a binary tree for subsequent processing in alphabetic order. [3]

b) Write a procedure to display the nodes in the reverse order. [4]

c) Explain with a sketch how the above representation could be stored in three one dimensional arrays together with a variable that points to the root node. Your sketch should show each array and its contents. [3]

d) Describe with illustration what happens if the Jurong outlet moves to Chinatown. [6]

e) Show the rotations that need to be done in order to obtain a balanced tree. [3]

7 An array is used to store the following services: Buffet Catering, BBQ, Tea Reception, Special Occasion, Meal Delivery, Packet Orders in alphabetical order. Alongside each service is a pointer to the head of a linked list for the details of the items in the menu for that service. Each item is accessed via a 3 letter code. These item codes are stored in alphabetical order.

a) Draw the above data structure. [3]

b) From the feedback received from customers the management has decided add a new service, Mini Buffet. For a start this service would have 10 items on its menu. Describe in detail the algorithm to add this service and the items to the data structure. [9]

c) Suggest a way of organizing the data in the computer system which allows access to the items in the menu in the way detailed above without the use of a linked list. Give one advantage and one disadvantage of this method. [3]

8. A system analyst is required to produce a decision table based on the following description.

For any orders over $400 there is no delivery charge. For any orders over between $200 and $400 there is a delivery charge of $10 for customers within a 5 km radius and $20 for customers further than 5 km. All other cases will be charged a flat fee of $20. To promote loyalty, VIP customers enjoy $10 discount on delivery charge if applicable.

Draw a decision table for the system analyst. [9]

THE END