



**SERANGOON JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION 2008**

COMPUTING

9754/02

Higher 2

Paper 2

**Tuesday
26 August 2008**

2.5 hours

Additional materials : Answer paper

INSTRUCTIONS TO CANDIDATES:

Write your name and CT group in the spaces provided on this cover sheet.

Answer **all** questions.

Write your answers on the separate answer paper provided.

If you use more than one sheet of paper, fasten the sheets together.

INFORMATION FOR CANDIDATES:

The number of marks is given in brackets [] at the end of each question or part question. You are reminded of the need for good English and clear presentation in your answers.

Name: _____

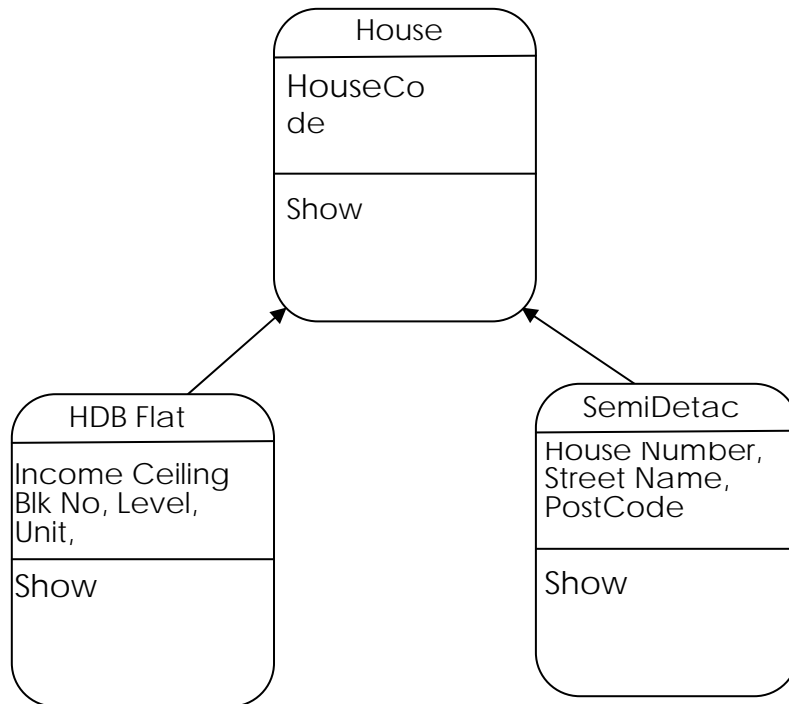
CT_Group: _____

This question paper consists of 4 printed pages (including this page).

- 1 A real estate agency sells houses. This agency stores data in a relational database. The agency also stores a Customer table and an Apartment table. The Apartment table contains the details of apartments that are available for sale and the Customer table contains details of people who want to buy houses.
 - a) Specify the attributes required for each table. [6]

A customer may visit many houses, and each house may be visited by many customers.
 - b) Show the relationship between Customer and House. [2]
 - c) Draw an entity-relationship (E-R) diagram between these tables that would satisfy the requirements of a relational database. [4]
 - d) The agency would also like to maintain a list of apartments that have been sold and keep track of the customers who have bought these apartments. Explain how the E-R diagram above can be modified to accommodate this.[6]
 - e) State **two** reasons why views of data may be used in the database. [2]
- 2 As the new system is developed, user and technical documentation are produced.
 - a) State **four** different sections normally found in user documentation. [4]
 - b) State **two** purposes of technical documentation. [2]
- 3 A website is used to advertise the houses for sale and to enable customers to pay for bookings on-line.
 - a) State **two** advantages to the agency of using the website for advertising. [2]
 - b) Customers are concerned about carrying out financial transactions on the website. Explain suitable methods of security to overcome these concerns. [4]
- 4 The agency keeps many electronic records on their customers.
 - a) The Data Protection Act states that all reasonable steps must be taken to ensure that personal data are kept secure. Give **two** practices that the agency might implement to ensure this. [2]
 - b) Apart from the need to keep data secure, give **three** implications for the agency of the Data Protection Act on the collection and keeping of personal data. [3]

- 5 The agency uses an object-oriented language to design their system. Some classes used are House, HDB Flat and Semi-Detached. These classes and some of their methods are shown on the diagram below.



- a) Using examples from the diagram, explain the meaning of the following terms:
- encapsulation
 - information hiding
 - inheritance
 - polymorphism [8]
- b) Software reusability is one of the benefits of Object-Oriented Programming (OOP). Describe how this can be achieved in OOP. [2]
- c) Describe **one** more benefit of OOP not mentioned earlier. [2]
- d) Give **two** disadvantages of OOP. [2]
- e) Data stored about products include:
- Description of the product
 - Quantity in stocks
 - Price
- State suitable data types for each of these items of data. [3]
 - Explain what is meant by a boolean data type and how it differs from an ASCII character. [3]

- 6 The agency also has a merchandize store that sells furniture and household appliances at discounted prices for customers. The agency would like to have an online system where customers can make orders through the Internet.
- A customer needs to provide details about them first before they can make an order.
 - A check is made to check if the items ordered are available.
 - The stocks would be updated accordingly.
 - If the items are not available, the customer would be asked if they would like to place an order.
 - They would be informed once the items have arrived.
 - Payment would be required once the order is confirmed.
 - Payment could be made through credit card or NETS.
 - An acknowledgement would be provided once the payment is cleared and the customer would be informed on the delivery date of the items
- a) Draw a data flow diagram to describe the system above. [10]
- b) Describe the software and hardware requirements of such a system. [5]
- c) What are the steps the designer needs to do first before starting to design the online system? [4]
- d) Identify **two** modules that would be required in the above system, describing its purpose and specifying the inputs and outputs from them. [6]
- 7 The orders that came in are served on a first come first served basis.
- a) Explain with diagrams how this could be done using a link-list kind of structure. [5]
- b) Define **three** operations for this Abstract Data Type (ADT). [3]
- 8 a) The system needs to perform data validation and data verification. Explain the difference between data validation and data verification and why are they important? [6]
- a) Discuss what can be done to validate and verify data. [4]

----- END OF PAPER -----