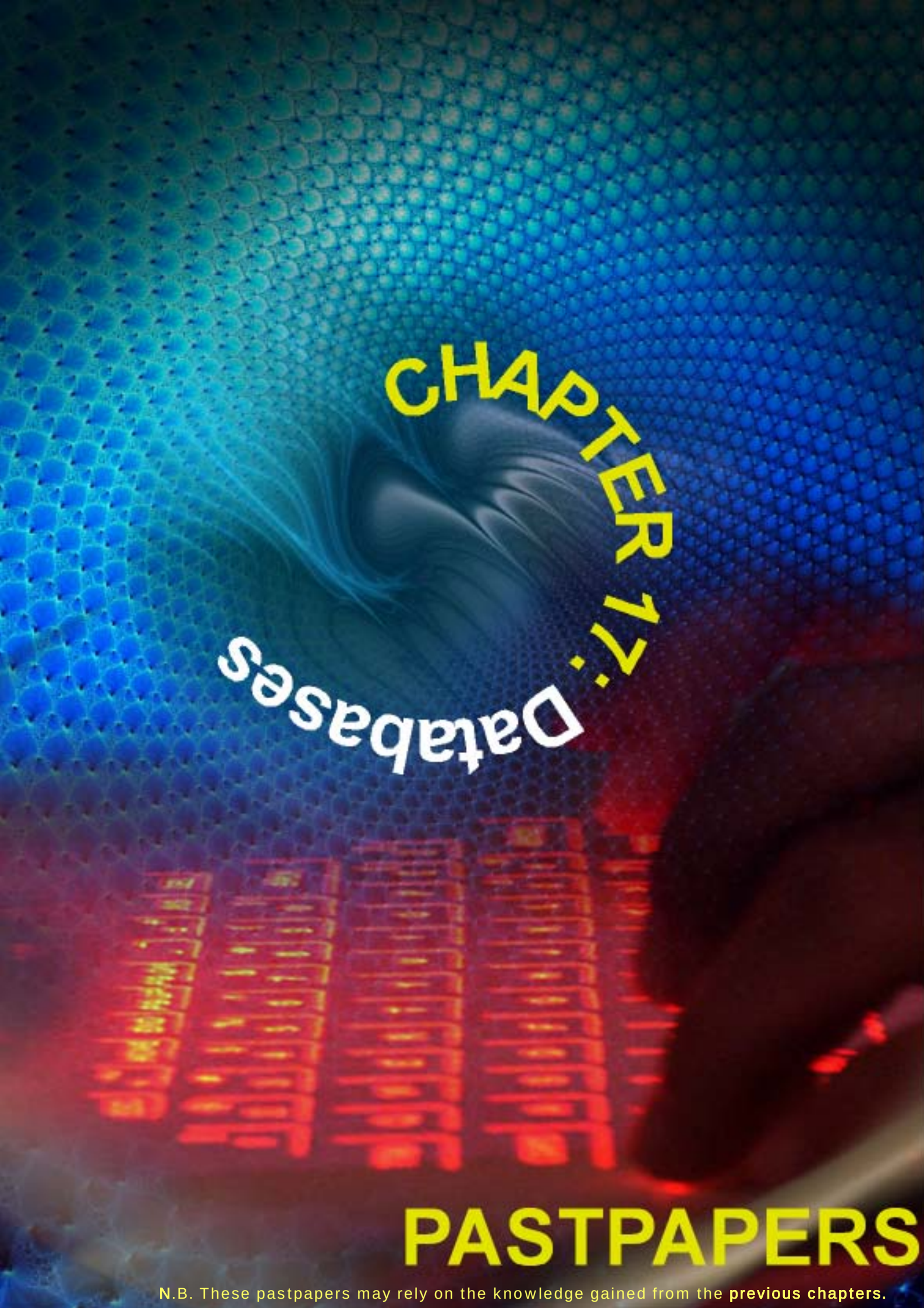

CHAPTER 17: Databases

PASTPAPERS

N.B. These pastpapers may rely on the knowledge gained from the **previous chapters.**

1 SEC '94-PAPER 2A-Q1 (CONSULT CH 16)

A public library has installed a computer to help with the issue and returning of books to its members. Each book in the library is assigned a unique book number, and each member has a membership card with a unique member number. The system uses two main files – the **books file** contains a record for each book in the library, while the **member file** contains a record for each member.

a. Suggest a suitable structure for the members' records. **[5]**

b. Suggest a suitable structure for the books record. **[5]**

c. Describe the benefits of computerizing the library.:

to the librarians **[2]**

to the members **[2]**

d. Describe the processing that takes place when:

a book is being issued. **[3]**

a book is being returned. **[3]**

Writing Space for Previous Question

2 SEC '94-PAPER 2B-Q1 (CONSULT CHs 3, 4, 15 & 16)

A public library has installed a computer to help with the issue and returning of books to its members. Each book in the library is assigned a unique book number, and each member has a membership card with a unique member number. The system uses two main files – the books file contains a record for each book in the library, while the members file contains a record for each member. **[3]**

a. Mention **THREE** fields you would expect to find in the numbers record. **[3]**

b. Mention **THREE** fields you would expect to find in the books record. **[2]**

c. Which field would probably be the key in these two types of records?

d. Mention **ONE** input device which can be used for quickly entering into the computer the number of a book being issued or returned. **[2]**

e. Briefly explain how the computer can be used to send a note to all the library members who have overdue books. **[4]**

f. Mention **ONE** advantage the computerized system has for members of the library. **[2]**

g. What kind of backing storage device would be most suitable for storing the members and books files? Why? **[2]**

h. What kind of backing storage devices would be most suitable for taking backups of the members and books **files**? Why? **[2]**

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3 SEC '95-PAPER 2B-Q4 (CONSULT CHs 9, 15,& 16)

A secondary school keeps a **database** of student information. There is one **record** for each student, with **fields** for name and surname, parent's name and surname, address, date of birth, form (1 to 5), class (A, B, etc), and a unique student number used as **key**. The database is accessible from number of **networked** computers in the school's administrative offices and library.

With reference to the above passage:

a. Explain each of the words printed in bold. **[10]**

b. Why couldn't the name and surname of students be used as the key field to this database? **[2]**

c. Why would the student records contain the date of birth, rather than the students' ages? **[2]**

d. Mention TWO validation checks which might be performed when a student's date of birth is entered. **[2]**

e. Before being deleted from the database, records of students leaving school are first copied to an ARCHIVE file. Explain what an archive file is, and mention one use the school might make of this file. **[2]**

f. An invitation to a talk is to be sent to all fifth-form students. Explain how the job of producing personalized invitation may be authorized using mail-merging. **[2]**

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Writing Space for Previous Question

4 SEC '96-PAPER 2B-Q4 (CONSULT CHs 3 & 16)

A video shop uses a database to keep track of the hiring and returning of videos. Each video shop has a unique video number recorded on its spine, and each member has a membership card with a unique member number. The system uses two main files – the video file contains a record for each video in the shop, and the members file contains a record for each registered member.

a. Which field would probably be the key field in these two files? Why? **[2]**

b. Describe THREE reports the owner of the video shop would be interested in obtaining from this database. **[3]**

c. The shop owner would also like to keep record of how many times each video has been hired. Briefly explain how this can be done automatically by the database system. **[4]**

d. Each video record has a field called **HIREDTO**, which contains the number of the member who currently has the video (or 0 if the video is not hired to anyone). Also, each member record has a field called **QUANTITY**, which records the number of videos the member currently has on hire. The system should not allow a member to hire more than 5 videos at a time. Briefly describe what processing the database system must do when:

(i) a member hires a video. **[4]**

(ii) a member returns a video. **[4]**

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Writing Space for Previous Question

5 SEC '97-PAPER 2A-Q8 (CONSULT CHs 11 & 16)

A small business owner uses a computerized system to keep stock records up-to-date. The files used in implementing the system are:

Stock File

Suppliers File

a. Identify typical information held in each of these files identifying the key-field in each file. **[6]**

b. What processing occurs every time a particular item is sold? **[2]**

A re-order level field in the Stock record specifies the minimum quantity of that item to be kept in stock. If the quantity in stock for the item falls below this level, the system automatically prints out an order form. Another field in the Stock records specifies the code number of the supplier from whom the part is bought.

c. Given that stock item 3 has a recorder level of 100 and currently there is a quantity of 200, describe the processing involved if a sale of 150 of item 3 is made. **[5]**

d. A 4GL would be more suitable for developing this system than a 3GL. Comment. **[4]**

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Writing Space for Previous Question

6 SEC '98-PAPER 1-Q6 (CONSULT CHs 9 & 13)

Mention ONE typical application for each of the following software packages. The first is done for you.

a. A spreadsheet: *Keeping accounts*

b. A Web browser: _____ **[2]**

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c. An anti-virus utility: _____ **[2]**

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d. A debugger: _____ **[2]**

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e. A database management system: _____ **[2]**

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7 SEC '99-PAPER 2A-Q2 (CONSULT CH 16)

A distributor of medical goods uses a computerized system to run the business. He keeps stored data of his clients and their orders.

a. Name two fields of the client file (including one field which helps identify different clients). **[2]**

The orders data is stored on **two** files – the first stores one record for each order made, while the second stores one record for each **item** in an order. This is shown below:

File 1

Client Number	**Order Number**
1234	1000
4321	0989

File 2

Order Number	**Item Number**
1000	456
1000	035
0989	125

Order Number	**Client Number**	**Array of items in order**					
1234	1000	456	035				
4321	0989	125					

The order number is used to link the two files.

b. Why is the above method better than having a single file of the form shown below, in terms of ***storage requirements***, and ***ease of updating the data***? **[2+2]**

c. The cost of an item and its description are held in a separate file called *items*. Briefly describe how this file is linked with file 2 shown above. **[2]**

Describe the processing that is required to:

i. Accept a client's order **[3]**

ii. Print out a bill for a client's order, showing the name and cost of each item on the order and the name of the client at the top. **[4]**

Applications such as this are frequently implemented using a ***DBMS*** rather than a conventional high-level programming language. What is a DBMS? **[2]**

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Writing Space for Previous Question

8 SEC '00-PAPER 1-Q8 (CONSULT CHs 13 & 16)

Provide **ONE** reason to explain each of the following statements:

a. **Direct access** is faster than **serial access.** **[2]**

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[2]

b. A **transaction file** is sorted on the same field as a **master file**.

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_____ **[2]**

c. **Check digits** may form part of bank account and credit card numbers.

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_____ **[2]**

d. An employee's record in a database includes a field for the **date of birth**, but not a field for the age.

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9 SEC '00-PAPER 2A-Q8 (CONSULT CHs 4, 15 & 16)

An environmental society has a computerized database system for its members. The following details are requested when a new member joins the society:

Name, surname, address, telephone number

Members have to pay an annual subscription.

(a) Name two other fields required in the number record. **[2]**

(b) Outline the details of the member record structure including each filed name, its data type and width as follows: **[5]**

Field Name	Data Type	Width
Name	Character	20

(c) Hence calculate the amount of storage space required in storing each record. **[3]**

The society issues a quarterly newsletter to its members.

(d) Suggest with reason, a software package best suited to design the newsletter. **[2]**

(e) Explain how the editorial board may issue a mailing list for sending the newsletter. **[3]**

(f) Suggest with reason, one peripheral device additional to the basic computer system that the society might have in order to carry out its activities. **[2]**

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Writing Space for Previous Question

10 SEC '00-PAPER 2B-Q1 (CONSULT CH 16)

(a) Distinguish between master and transaction files. For a named business application of your choice, explain what information might be held in the transaction file. **[5]**

For a typical payroll application,

(i) List the fields that you would expect to find. **[2]**

(ii) Define the term key field. Suggest, giving reasons, a suitable key field. **[2]**

(b) If you were told that its payroll application would be used at a place of work where there are a number of foreigners working there, how would this additional information effect the choice of the key field given earlier? **[4]**

(c) Mention four data management and/or maintenance utilities that you would expect to find in the payroll application. **[4]**

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Writing Space for Previous Question

11 SEC '01-PAPER 1-Q3 (CONSULT CHs 15 & 16)

The following questions are related to databases.

a. What is the difference between *sorting* and *querying* a database?

_____ **[2]**

b. What is the difference between a *database field* and a *database record*?

_____ **[2]**

c. What is *mail-merge*?

_____ **[2]**

12 SEC '01-PAPER 2A-Q6

In a school the librarian uses a computerized system to keep information about books and students. This computerized library system uses the following files:

Books File

Members (Students) File

(a) Identify typical information held in each of these files identifying the key-field in each case.

(b) Name TWO file maintenance faculties that the system provides. **[6]**

A loans file, storing information of borrowed books, has the following file structure: **[2]**

MEMBERSHIP NUMBER	ISBN 1	ISBN 2	ISBN 3	DATE IN

Each student may borrow three books at a time for a period of three weeks.

When a student wants to borrow some books a new record in the loans file must be added.

(c) What preliminary check must be made on the loans file when a student goes to borrow some books? **[2]**

(d) Describe the processing involved when a student returns the books. **[3]**

(e) What processing occurs in order to issue reminders to students who are late in returning books? **[4]**

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Writing Space for Previous Question

13 SEC '01-PAPER 2B-Q2 (CONSULT CHs 2, 7, 11, 13, 14 & 15)

In each of the following cases state ONE major difference between both terms.

(a) *Random Access Memory* and *Read Only Memory* **[1]**

(b) *Hardcopy* and *Softcopy* **[2]**

(c) *Spreadsheet* and *database* programs. **[2]**

(d) *Master* and *Transaction* files **[2]**

(e) *Computer Aided Design* and *Computer Aided Learning Systems.* **[2]**

(f) *Assembly* and *Machine Code Languages* **[2]**

(g) *Syntax* and *Run-time errors* **[3]**

(h) *Command line Interface* and *Graphical User Interface* **[3]**

Writing Space for Previous Question

14 SEC '02-PAPER 2A-Q6 (CONSULT CHs 14, 15 & 16)

Mr. Borg, the owner of a video shop, has a computerised system for keeping records. The system was tailor made to his specific requirements a few years ago. Currently the system uses three files: Video file, Members file, Loans file.

Video File

Video number	File name	Director	Film Type	Viewer type	Picture house	Release date

Member File

Member number	Identity number	Telephone number	Address

Loan File

Member number	Video number	Date out	Rental type

Explain what is meant by a 'tailored' system in this context. **[1]**

With the aid of a diagram, design a typical menu interface for the above video shop application. **[6]**

Recently, Mr.Borg has added films on DVD to his rental collection, which previously consisted of videotapes only. He wishes to have a record of this information.

Modify the video file structure to include this information **[1]**

Does this change in the video file structure incur any changes in the video shop application program. **[2]**

Mr.Borg has been advised to consider a database system as an alternative to his existing conventional file system.

What is a database system? **[2]**

Give *one* reason in support to the given advice. **[1]**

Give *one* reason why Mr.Borg might decide to keep the conventional application system. **[1]**

Briefly describe how a personalized newsletter may be sent to borrowers if a standard database is used. **[3]**

Writing Space for Previous Question

15 SEC '02-PAPER 2B-Q5 (CONSULT CH 9)

(a) For a stock control system, explain the seven steps in the system development life cycle **[7]**

(b) Distinguish between shareable and non-shareable resources. **[2]**

(c) Discuss the advantage of a network over a number of standalone personal computers. **[4]**

(d) Imagine that a system was originally being developed to work on standalone computers. The analyst has now been informed that the system must work on a network. What would be the effects of this change on the development. **[4]**

Writing Space for Previous Question

16 SEC '03-PAPER 2A Q2 (CONSULT CHs 9 & 16)

An estate agent needs to set up a database of all the properties that the company has available. Every record in this database will identify a particular property for sale, containing the name of the owner, the address and the telephone number.

(a) Mention four other fields which are relevant and could be included in a property's record. **[4]**

(b) Give a suitable keyfield for every record. **[2]**

(c) Explain the terms validation and verification. **[2]**

(d) Name and explain three validation processes which can be used in the above system. **[6]**

(e) How can the estate agent make use of information technology to improve the company's advertising and reach a wider market? **[3]**

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Writing Space for Previous Question

17 SEC '04-PAPER 2B Q1 (CONSULT CHs 9, 13 & 16)

(a) You are assigned a project to build a database for a football club holding information about its players. Four of each record's fields are "Name", "Age", "Shirt Number" and "Member Number".

(i) State data types for the fields "Name" and "Age". **[2]**

(ii) Explain briefly how you would proceed to display records of players who are not yet sixteen years old. **[2]**

(iii) "Age" is not ideal to have as a field. If you were to replace this field by another, what would you propose? **[2]**

(iv) Which of the four fields mentioned above can be used as a keyfield? Why? **[2]**

(b) Explain the terms:

(i) HTML; (ii) Hacker; (iii) Spam. **[6]**

(c) Choose any high-level language of your choice and write down: **[3]**

(i) a statement that performs an input operation;

(ii) a statement that performs an output operation;

(ii) a statement that performs a calculation and stores the result in a variable.

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Writing Space for Previous Question

18 SEC '05-PAPER 1 Q3 (CONSULT CHs 8, 13 & 16)

Differentiate between the following pairs:

(a) check digit and range check; **[2]**

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(b) transcription error and transmission error; **[2]**

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(c) data record and data file. **[2]**

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19 SEC ‘06-PAPER 1 Q10

A school secretary keeps a file of student records. Each student record stores the student’s name (20 bytes), surname (20 bytes), student number (7 bytes), class number (3 bytes), home address (50 bytes) and guardian telephone number (8 bytes).

(a) Why is it important that a record contains a key-field **[2]**

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(b) Identify a suitable key-field for this student record **[1]**

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(c) Given that there are 128 student records in the file, what is the memory space in *kilobytes* occupied by the students’ file?

_____ **[3]**

20 SEC '06-PAPER 2A Q5 (CONSULT CHs 3, 4, 13, 15 & 16)

A library is planning to set up a computer database of all the books available. Every record in this database will identify a particular book containing the Title and Author.

a) State an input device which is used to record data about a book when it is borrowed. **[1]**

b) Mention FOUR other fields which are relevant and necessary for the book record system. **[4]**

c) What is meant by the term *key-field*? Identify a suitable key-field for the book record system. **[2]**

d) Describe the importance of *validation* and *verification* in the context of the library system. **[4]**

e) In the case of disk corruption, explain what measures must be taken to prevent data loss. **[2]**

f) The library offers the facility of searching the database online to all its members. Which two items of information need to be keyed in before a member can access the system?. **[2]**

g) What is meant by the term *mail-merge*? How can this be used to inform members of the library about new publications? **[2]**

Writing Space for Previous Question

21 SEC '06-PAPER 2B Q2 (CONSULT CHs 8, 13 & 16)

A garage keeps a computer database of spare parts in stock. Every record in this database will identify a particular spare part through the following fields: Description, Quantity, Part Number, Location and Selling Price.

a) Define the data types for the fields mentioned. **[5]**

b) Define the following terms:

i. File;

ii. Record;

iii. Field;

iv. Key field **[8]**

c) The database is stored on disk. What type of file access would be used? **[1]**

d) In case of disk corruption, what measures must be taken to prevent data loss? **[1]**

e) While keying in the data, the owner makes the following mistakes in the Description field: 'Filler' instead of 'Filter' and 'Gakset' instead of 'Gasket'. Identify the type of data entry errors the owner made. **[2]**

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Writing Space for Previous Question

22 SEC '06-PAPER 2B Q6 (CONSULT CHs 6, 8 & 10)

a) What is the function of the Arithmetic Logic Unit (ALU) in the CPU? **[2]**

b) Identify and briefly describe the function of two registers found in the Control Unit. **[4]**

c) State whether each of the following statements is TRUE or FALSE. **[5]**

i. The truth table for the OR function shows *one* everywhere except where all inputs are *zeros*.

ii. A data bus is an area of computer memory allocated to transferring data between the computer and a peripheral.

iii. The Accumulator holds the address part of the instruction being executed.

iv. A field is a collection of records designed to hold a single data item of a specified type.

v. A Parity check is a test applied to binary data to ensure that it has been stored or transmitted without error.

d) Briefly explain the Fetch-Execute Cycle. **[6]**

Writing Space for Previous Question

23 SEC '07-PAPER 1 Q5

The following table shows a section of the file containing details of school library books.

ISBN	Book Author	Book Title	Publisher	Date of Publication	Quantity Available
123450678	Abela, T.J.	Study Skills	PegMe	2005	3
012304560	Zammit, C.	Into Computer Science	MacPen	2003	4
115010524	Grima, P.	Ghost Stories	Oxtail	2004	1
614139184	Borg, J.	Computerising library systems	Shortman	2002	1
790010012	Mizzi, S.	Maths for you	Pan Book	2000	2

a) Use the information above to identify the **file**, **the records** and the **fields**. **[3]**

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b) What is the key-field of this file and what is it used for? **[2]**

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c) Suggest suitable validation checks for the following book data: **[3]**

i) ISBN

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ii) Book Author

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iii) Date of Publication

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