

Revision Sheet

A-Level Computer Science · Unit 13 Data Representation

10 vocabulary items · 38 marks of exam questions (6 questions)

Part 1 · Vocabulary review (10 items). The terms this unit is examined on most. Mark it yourself from the answer key.

Section A · Chinese to English

Write the English word.

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|-----|-------|-----|
| 1. | <hr/> | [1] |
| 2. | <hr/> | [1] |
| 3. | <hr/> | [1] |
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| 10. | <hr/> | [1] |

Part 2 · Exam questions (38 marks, 6 questions) begins on the next page. They are ordered easy to difficult and none of them has been set before.

11 Two descriptions of user-defined data types are given.

Give appropriate type declaration statements for each, including appropriate names.

(a) A data type to hold a set of prime numbers below 20. These prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19

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..... [2]

(b) A data type to point to a day in the week, for example Monday.

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..... [2]

12 Enumerated and pointer are two non-composite data types.

(a) Write **pseudocode** to create an enumerated type called `Parts` to include these parts sold in a computer shop:

`Monitor, CPU, SSD, HDD, LaserPrinter, Keyboard, Mouse`

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..... [2]

(b) Write **pseudocode** to create a pointer type called `SelectParts` that will reference the memory location in which the current part name is stored.

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..... [2]

13 (a) Compare sequential and serial methods of file organisation.

[4]

(b) State the most suitable method of file access when a record is referenced by a unique address on a disk-type storage medium.

..... [1]

(c) State the most suitable method of file access when a bank stores its data records in ascending order of account number.

..... [1]

14 (a) State what is meant by the term **enumerated data type**.

.....

..... [1]

(b) State what is meant by the term **pointer data type**.

.....

..... [1]

(c) The months of the year are: January, February, March, April, May, June, July, August, September, October, November and December.

Write the **pseudocode** statement to define the data type `Quarter1`, to hold the names of the first three months of a year.

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..... [2]

(d) The composite data type `Pet` is used to store data about the various pets of a group of students. It uses these fields:

Field name	Data type
PetName	String
AnimalType	String
PetAge	Integer
PetGender	Char
OwnerName	String

(i) Write the **pseudocode** statement to set up a variable for one record of the composite data type `Pet`.

.....

..... [1]

(ii) Write **pseudocode** to store the details of the following pet, in the variable you set up in **part (d)(i)**.

PetName	AnimalType	PetAge	PetGender	OwnerName
Tibbles	Cat	8	M	Jasmine Smith

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[3]

15 Data types can be defined using pseudocode.

The data type, `LibraryRecord`, is defined in pseudocode as:

```
TYPE LibraryRecord
  DECLARE Title : STRING
  DECLARE Fiction : BOOLEAN
  DECLARE Author : STRING
  DECLARE NumberOfCopies : INTEGER
ENDTYPE
```

A variable, `LibraryBook`, is declared in pseudocode as:

```
DECLARE LibraryBook : LibraryRecord
```

(a) Write **pseudocode** statements to assign:

- A Level Computer Science to `Title` of `LibraryBook`
- `FALSE` to `Fiction` of `LibraryBook`.

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..... [2]

(b) The type definition for `LibraryRecord` is changed.

- (i) The value for `NumberOfCopies` must be between 1 and 10 inclusive.

Write the updated line of **pseudocode** from the type definition of `LibraryRecord` to implement the change.

.....

..... [1]

- (ii) Every copy of every book is now uniquely identified by an accession number, `AccessionNumber`, as it is added to the library. Each library record will include one or more accession numbers. Each accession number is an integer.

Write the extra line of **pseudocode** needed in the type definition of `LibraryRecord`.

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..... [2]

(c) A record is a user-defined composite data type.

Explain what is meant by a **user-defined composite data type**.
Include an example of **another** user-defined composite data type in your answer.

[3]

16 (a) Describe the purpose of a user-defined data type.

[2]

(b) Define, using pseudocode, the following enumerated data types:

(i) SchoolDay to hold data about the days students are usually in school.

[1]

(ii) WeekEnd to hold data about the days that are not school days.

[1]

(c) Define, using pseudocode, the composite data type ClubMeet. This will hold data about club members that includes:

- first name and last name
- the two days they attend:
 - one on a school day
 - one not on a school day.

Use the enumerated types you created in part (b).

[4]