

Revision Sheet

A-Level Computer Science · Unit 9 Algorithm Design and Problem-solving

10 vocabulary items · 39 marks of exam questions (5 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.

1.	<div></div>	[1]
2.	<div></div>	[1]
3.	<div></div>	[1]
4.	<div></div>	[1]
5.	<div></div>	[1]
6.	<div></div>	[1]
7.	<div></div>	[1]
8.	<div></div>	[1]
9.	<div></div>	[1]
10.	<div></div>	[1]

Part 2 · Exam questions (39 marks, 5 questions) begins on the next page. They are ordered easy to difficult and none of them has been set before.

11 Data is a global 1D array containing 30 elements of type `STRING`

An algorithm will output:

- all non-blank elements (elements that do **not** contain an empty string)
- the final total of the number of elements output.

Complete the program flowchart to represent the algorithm:



12 Data is a global 1D array containing 20 elements of type `REAL`

An algorithm will:

- input a sequence of real values, one at a time
- assign each value to consecutive array elements, starting from index 1
- end when the value 99.9 is input, or all 20 elements have been assigned (the value 99.9 must **not** be stored in the array).

Complete the program flowchart to represent the algorithm:

START

END

13 An algorithm will:

- input 100 integer values, one value at a time
- store the first value input into the first location of the array `Number`
- store the next input value in the next unused location of the array `Number`
- output the contents of `Number` array in the opposite sequence to that in which the values were input.

Complete the program flowchart to represent the algorithm.

Variable declarations are **not** required.

START

END

14 A program stores a user’s date of birth using a variable `MyDOB` of type `DATE`.

(a) Write a pseudocode statement, using a function from the **insert**, to assign the value corresponding to 17/11/2007 to `MyDOB`.

..... [1]

(b) `MyDOB` has been assigned a valid value representing the user’s date of birth.

Write a pseudocode statement to calculate the number of months from the month of the user’s birth until the end of the year and to assign this to the variable `NumMonths`.

For example, if `MyDOB` contains a value representing 02/07/2008, the value 5 would be assigned to `NumMonths`.

..... [2]

(c) The program will output the day of the week corresponding to `MyDOB`.

For example, given the date 22/06/2023, the program will output "Thursday".

An algorithm is required. An array will be used to store the names of the days of the week.

Define the array **and** describe the algorithm in **four** steps.

Do **not** use pseudocode statements in your answer.

Array definition

.....

Step 1

.....

.....

Step 2

.....

.....

Step 3

.....

.....

Step 4

.....

.....

15 Sylvia is testing a program that has been written by her colleague. Her colleague tells her that the program does not contain any syntax errors.

(a) (i) State what her colleague means by “does not contain any syntax errors”.

.....

.....

..... [1]

(ii) Identify **and** describe **one** other type of error that the program may contain.

Type of error

Description

..... [2]

(b) Complete the following table by giving the appropriate data type in each case.

Use of variable	Data type
The average mark in a class of 40 students	
An email address	
The number of students in the class	
To indicate whether an email has been read	

[4]

- (c) An airline wants to provide passengers with information about individual flights and allow them to book their flight using an online booking system.
- (i) Tick (✓) **one** box in each row of the table to indicate whether each item of information would be essential for the customer when making the booking.

Information	Essential	Not essential
Departure time		
Flight number		
Departure airport		
Aircraft type		
Ticket price		
Number of seats in aircraft		

[3]

- (ii) Identify the technique used to filter out information that is not essential when designing the booking system **and** state one benefit of this technique.

Technique

Benefit

.....

[2]

- (iii) Identify **two additional** pieces of essential information that a passenger might need when booking a flight.

1

2

[2]