



Professional Qualification in
COMPUTING AND INFORMATION SYSTEMS
Level 4 Diploma

UNIT 2 – COMPUTER PROGRAMMING

Question 1

Compare and contrast the features of client-side and server-side web scripting. (10 marks)

Question 2

- (a) Describe **ONE** key issue in selecting a programming language to produce a program for a mobile app. (5 marks)
- (b) Identify and describe **ONE** application for which C++ would be a suitable programming language. (5 marks)

Question 3

Identify the primitive data type most suitable for each of the following data situations:

- (a) Capacity of a sports stadium. (2 marks)
- (b) Response to a question with a yes/no answer. (2 marks)
- (c) Accurate scientific measurement made to five decimal places. (2 marks)
- (d) Phrase used by a cloud-based voice service, such as "my name is Alexa". (2 marks)
- (e) Single letter to represent a group, such as 'M' for male and 'F' for female. (2 marks)

Question 4

Using a personnel database as an example, illustrate how composite data types are essential for database systems. (10 marks)

Question 5

- (a) State what is meant by 'source code'. (2 marks)
- (b) Identify **TWO** benefits of writing programs in machine code. (4 marks)
- (c) Identify **TWO** disadvantages of writing programs in machine code. (4 marks)

Question 6

Discuss what is meant by the fetch-execute cycle. (10 marks)

Question 7

- (a) State what is meant by 'code tracing'. (2 marks)
- (b) Identify **TWO** benefits to programmers of code tracing. (4 marks)
- (c) Identify **TWO** suitable column headings of a trace table to check the algorithm below:

```
for (int i = 0; i <=3; i++) {  
    if (i <= d0ne) {  
        total = total + d0ne  
    } else {  
        d0ne = d0ne * 2  
    }  
}
```

(4 marks)

Question 8

Draw a flowchart to illustrate an algorithm that will place a list of one hundred random numbers into numerical order. (10 marks)

Question 9

- (a) State what is meant by 'object-oriented programming'. (2 marks)
- (b) Identify **TWO** characteristics of object-oriented programming. (4 marks)
- (c) Identify **TWO** advantages that object-oriented programming has over imperative programming. (4 marks)

Question 10

- (a) State what is meant by the term 'access modifiers' in object-orientated design. (2 marks)
- (b) Identify **TWO** uses of access modifiers. (4 marks)
- (c) Identify **TWO** features of cohesion in object-orientated engineering. (4 marks)