AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

Level 3 Technical Level IT
COMPUTER PROGRAMMING

Unit R/506/6118

Friday 23 June 2017 Morning Time allowed: 2 hours

Materials
For this paper you must have:
- a ruler.

You may use:
- a calculator
- stencils or other drawing equipment (eg flowchart stencils).

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer all questions in **both** sections.
- You must answer each question in the space provided. Do not write outside the box around each page or on crossed through pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- If you need more space use the additional pages at the back of this booklet.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- There are 50 marks in **Section A** and 30 marks in **Section B**.

Advice
- In all calculations, show clearly how you work out your answer.
- Use diagrams, where appropriate, to clarify your answers.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
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9	
10	
11	
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13	
14	
15	
16	
17	
18	
TOTAL	

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

Section A

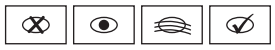
Answer **all** questions in this section.

Total for this section: 50 marks

In the multiple choice questions, only **one** answer per question is allowed.

For each answer completely fill in the oval alongside the appropriate answer.

CORRECT METHOD 

WRONG METHODS 

If you want to change your answer you must cross out your original answer as shown. 

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown. 

0 1 Which **one** of the following is a scripting language?

A C 

B Python 

C Pascal 

D Oz 

[1 mark]

1

0 2 Which **one** of the following is **not** a feature of a high-level language?

A Closest to human language 

B Ease of error detection 

C Machine independent 

D Maps closely to processor instructions 

[1 mark]

1

Turn over for the next question

0 3 What tool is required to translate assembly language into machine code on the same computer?

A Assembler ⬭

B Cross-assembler ⬭

C Debugger ⬭

D Optimiser ⬭

[1 mark]

1

0 4 In programming, First In, First Out (FIFO) is

A A method for manipulating a data buffer ⬭

B An abstract data type ⬭

C The final output of a function ⬭

D Where the top of the stack is processed first ⬭

[1 mark]

1

0 5 Read the following code. What will be output to the screen?

[1 mark]

```
01  var grade = 80
02  var message = ‘’
03
04  if (grade > 40) {
05      message = "You have passed";
06  } else if (grade > 55) {
07      message = "You have a merit";
08  } else if {grade > 70} {
09      message = "You have a distinction";
10  }
11
12  window.alert(message)
```

A An empty string ⬭

B You have a distinction ⬭

C You have a merit ⬭

D You have passed ⬭

1

0 6 Backtracking is a general algorithmic technique.

Explain how a backtracking algorithm works.

[3 marks]

3

Turn over for the next question

0 7 **Table 1** identifies two types of programming language.

Using the list below, place each characteristic in its correct position in **Table 1**.

[3 marks]

Characteristic:

- Source code
- Object code
- Mnemonics
- Abstraction

Table 1

Type of language	Characteristics	
Low-level		
High-level		

3

0 8 This question is about the modular development approach.

0 8 . 1 Identify **two** advantages of the **modular development approach**.

[2 marks]

0 8 . 2 What should be considered to prevent problems occurring during development?

[2 marks]

_____

_____

_____

_____

4

0 9 Software design or development lifecycle is a process used to design high-quality software.

0 9 . 1 Describe what is meant by 'closed beta' testing.

[1 mark]

_____

_____

0 9 . 2 Name **two** phases of the software design lifecycle that come after implementation or coding.

[2 marks]

Phase 1 _____

Phase 2 _____

3

Turn over for the next question

1 0 A local garage has asked you to create a navigation structure for its web page.

Arrange the following pages so a user could navigate easily around the website.

[3 marks]

- Home
- Booking history
- Book a repair
- Book an MOT
- Change my booking
- About us
- Contact us
- Customer accounts
- Our services
- Our history
- Our awards

3

1 1 You buy components to build and test a new computer for delivery to a client.

Draw a **structure diagram** which illustrates this process.

[3 marks]

3

1 2 Explain why developers might use the Concurrent Versions System (CVS).

[2 marks]

2

1 3 Pseudocode is an informal language which helps programmers develop algorithms.

Rewrite the following problem as pseudocode:

[6 marks]

- Input 50 positive numbers.
- Add up the odd numbers and display the total.
- The program should terminate and display the current total if a **negative number** is input at any point.

6

1 4 Programming languages can be used to enhance web page interactivity.

1 4 . 1 Name **two** languages that could be executed directly on a web server.

[2 marks]

1 4 . 2 Identify **one** language that could be used to enhance web page interactivity and, using examples, explain how this could be done.

[4 marks]

6

Turn over for the next question

1 5 A programmer using a high-level language should write code so that it can be maintained easily.

1 5 . 1 Explain the abstraction principle in terms of good programming practice.

[3 marks]

1 5 . 2 State **three** more principles you could follow to make code easier to maintain.

[3 marks]

1 _____

2 _____

3 _____

6

1 6 Iterative design is commonly used to develop human–computer interfaces.

Explain the typical steps of iterative design when programming user interfaces.

[6 marks]

6

Turn over for Section B

Section B

Answer **all** questions in this section.

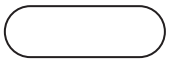
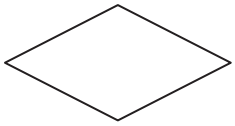
Total for this section: 30 marks

1 7 You are designing a character for a game. The character must make decisions about what to do in the 30 minutes from waking up to leaving the house.

Draw a flowchart which:

- shows waking up to an alarm until leaving the house
- handles a 5-minute snooze button
- handles three other decisions required
- checks important decisions before leaving.

[12 marks]

Flowchart symbol	Name
	Start/end
	Input/output
	Process
	Decision

12

1 8 Examine the following code.

```
pageref=new Array()
var count=0

pageref=['home','default.asp','services','services.asp','price
s','prices.asp','contact','contact.asp','about
us','about.asp']

for (var i=0; i<pageref.length; i+=2) {
  displaypage(i)
}

window.alert(count)
temp+=1

function displaypage(num) {
  var x = filename(num)
  window.alert('the '+pageref[num]+' page has filename '+x)
  switch(num) {
    case 4:
      window.alert('add price list')
      break;
    case 6:
      window.alert('add contact database')
      break;
  }
}

function filename(num) {
  var temp=0
  count+=1
    return pageref[num+1]
}
```

1 8 . 1 The code does not have any annotations to show how it works. The programmer has used `window.alert()` to output messages to the screen to help with debugging.

Write technical comments which explain how the code and program work.

Select **five** different aspects to comment on. Marks are awarded for:

- selecting different aspects carefully (eg, don't comment on two `window.alert` commands)
- the technical understanding shown
- using clear and concise language.

[11 marks]

1 8 . 2 There is an exception error in the code. Give the number of the line where it occurs and explain why it happens.

[3 marks]

1 8 . 3 Apart from `window.alert()`, describe **two** other techniques you could use to test and debug the code.

[4 marks]

18

END OF QUESTIONS

If needed, use the following pages to continue your answers. Write the question number beside your answer.