AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

Level 3 Technical Level
IT: PROGRAMMING

Unit 2 Computer programming

Monday 22 January 2018 Morning Time allowed: 2 hours

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

You may use:
- a scientific calculator (non-programmable)
- 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.
- You must answer each question in the space provided. Do not write outside the box around each page or on blank 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 for Section A and 30 marks for Section B.
- Both sections should be attempted.
- 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	
Question	Mark
1 – 5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
TOTAL	

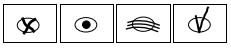
Section A

Answer **all** questions in this section.

Only **one** answer per question is allowed.

For each question completely fill in the circle 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 of the following is **not** a type of variable?

[1 mark]

A Global. ⬭

B Local. ⬭

C Syntax. ⬭

D Static. ⬭

1

0 2 In the testing phase of the software design or development lifecycle, which group is most likely to be involved with **closed beta** testing?

[1 mark]

A General public. ⬭

B An invited group. ⬭

C Developers. ⬭

D Anyone interested. ⬭

1

0 3 What will be output to screen from the following code?

[1 mark]

```
01  def.fullname(x, y):
02      Return y+x
03
04  print("Name is "+fullname("Iqmal","Khalid"))
```

A Name is Khalid Iqmal ⬭

B Name is Iqmal Khalid ⬭

C Name is KhalidIqmal ⬭

D Name is ⬭

1

0 4 From the list below, choose a language that is 'specific to a particular architecture'.

[1 mark]

A A high-level language. ⬭

B C++ ⬭

C Assembly language. ⬭

D Python. ⬭

1

0 5 In a UML class diagram what indicates that a class is abstract?

[1 mark]

A Class name is in italics. ⬭

B Class name is underlined. ⬭

C Class name is all-caps. ⬭

D Class name is in bold. ⬭

1

0 6 Explain the difference between assembly language and machine code.

[2 marks]

2

0 7 When the code below is tested, the following is output to the screen:

Total within function: 100
Total outside function: 0

```
01  import math
02  total = 0
03
04  def distance (x1, y1, x2, y2):
05      dx = x2 - x1;
06      dy = y2 - y1;
07      total = (dx*dx + dy*dy);
08      print("Total within function: ",total);
09      return total;
10
11  distance(0,0,8,6)
12
13  print("Total outside function: ",total)
```

0 7 . 1 Explain why the totals are different.

[2 marks]

0 7 . 2 Without changing the function definition, fix the code so the totals are the same.

[1 mark]

3

0 8 In programming, what is functional decomposition?

[3 marks]

3

0 9 . 1 Use examples to explain the difference between a **pre-condition** loop and a **post-condition** loop.

[4 marks]

0 9 . 2 The following code should add the numbers 1, 2, 3, and 4 together and output 10.

```
01  int total = 0;
02  for (int x = 1; x >= 4; x++)
03  {
04      total = total + x;
05  }
06  Console.WriteLine(total);
```

What needs to be corrected to make this happen?

[1 mark]

5

1 0 . 1 Explain the concept of a programming paradigm.

[4 marks]

1 0 . 2 State **one** language associated with the functional programming paradigm.

[1 mark]

1 0 . 3 Name **one** other common programming paradigm.

[1 mark]

6

1 1 . 1 Give **three** reasons why you would use a flowchart to demonstrate a program to a client.

[3 marks]

Reason 1 _____

_____

Reason 2 _____

_____

Reason 3 _____

_____

1 1 . 2 Using appropriate symbols, draw a flowchart extract that shows an example of a decision **and** a process.

[3 marks]

6

1 2 . 1 Explain the difference between a **real** and an **integer** variable.

[2 marks]

1 2 . 2 What does the keyword **const** stand for and why is this different from a variable?

[2 marks]

1 2 . 3 Explain what is meant by the terms **variable**, **assignment** and **expression**.

[3 marks]

1 2 . 4 Give a line of code which shows the relationship between them.

[1 mark]

8

1 3 . 1 Explain why a developer could learn different things from client testing and user testing.

[3 marks]

1 3 . 2 Student test scores are input into a database as a raw score out of 60 and as a percentage.

Complete **Table 1** with appropriate test data.

[3 marks]

Table 1

TEST DATA	Raw score	Test score (percentage)
Normal		
Extreme		
Invalid		

6

Turn over for the next question

1 4 Explain how the following code could be improved so that it demonstrates the principles of good programming practice.

[6 marks]

```
01 name1 = input("Player 1: What's your name? ")
02 print("Hello",name1)
03
04 name2 = input("Player 2: What's your name? ")
05 print("Hello",name2)
06
07 print(name1)
08 age1 = input(", how old are you?")
09 print(name2)
10 age2 = input(", how old are you?")
11
12 if int(age1)<18: print(name1+" shouldn't be playing this
13 game!")
14 if int(age2)<18: print(name2+" shouldn't be playing this
15 game!")
16
17 if int(age1)<18: print(name1+" shouldn't be playing this
18 game!")
19 if int(age2)<18: print(name2+" shouldn't be playing this
20 game!")
```

6

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Turn over for the next question

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ANSWER IN THE SPACES PROVIDED

Section B

Answer **all** questions in this section.

1 5 . 1 Compare the **Incremental** and **V-model** software development approaches, including the advantages and disadvantages of each model.

[12 marks]

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1 5 . 2 Explain **two** other software development approaches.

[6 marks]

18

1 6 You have designed a stock control system for a client who runs a small toy shop.

The system consists of a website front-end (to display and sell the toys to customers) and a database back-end (to record sales and to keep records of the current stock level).

Design a test strategy for installing and testing the system.

Justify your choices.

For example, you could consider:

- what is critical to success
- different users and audience
- tools and testing techniques
- structure and data
- remedial action.

[12 marks]

12

END OF QUESTIONS

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

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ANSWER IN THE SPACES PROVIDED

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