

Surname	Centre Number	Candidate Number
Other Names		0



**GCSE**

4341/01



S16-4341-01

**COMPUTER SCIENCE**

**UNIT 1: Understanding Computer Science**

A.M. WEDNESDAY, 8 June 2016

1 hour 30 minutes

<b>For Examiner's use only</b>	
<b>Total</b>	

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen. Do not use pencil or gel pen. Do not use correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part-question.

Quality of written communication (QWC) will be assessed in question **15**.



JUN1643410101

*Answer all questions.*

1. Tick (✓) to show which **four** of the following items are protocols:

[4]

IP	<input type="checkbox"/>
ISP	<input type="checkbox"/>
P2P	<input type="checkbox"/>
TCP	<input type="checkbox"/>
LAN	<input type="checkbox"/>
HTTP	<input type="checkbox"/>
FTP	<input type="checkbox"/>
ROM	<input type="checkbox"/>



2. (a) Name **four** components of the Central Processing Unit (CPU) and describe the function of **each** named component. [8]

Component 1 .....

Function .....

.....  
.....

Component 2 .....

Function .....

.....  
.....

Component 3 .....

Function .....

.....  
.....

Component 4 .....

Function .....

.....  
.....

(b) State the purpose of hardware ports and give an example of a hardware port. [2]

Purpose

.....  
.....

Example of a port

.....  
.....



3. (a) A firm of architects store plans for houses using cloud storage. Describe **two** advantages for the architects of using cloud storage compared with other traditional secondary storage methods. [2]

Advantage 1 .....

.....

Advantage 2 .....

.....

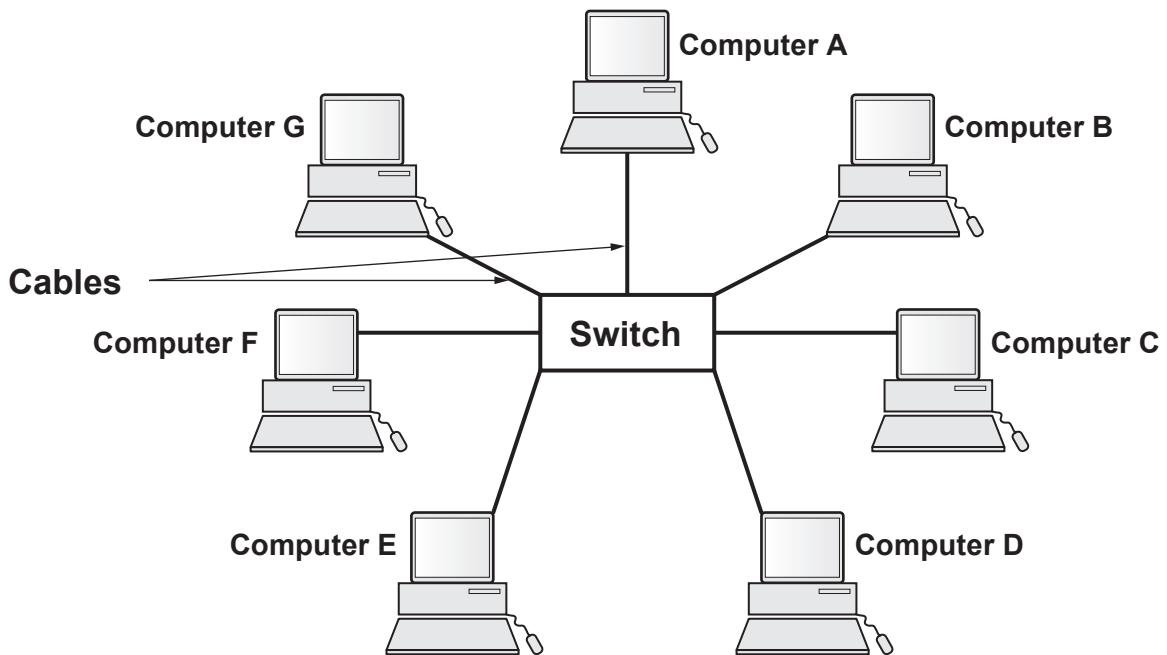
- (b) Some of the architects still prefer to store their designs on a traditional secondary storage medium. Give a reason why they might not want to use cloud storage. [1]

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4. Below is a labelled diagram of a star topology network.





5. There are many different types of errors that can occur when developing computer programs.

(a) State the name of the **two** different types of programming error described below.

(i) Unexpectedly halts the program. [1]

.....

(ii) The program produces the wrong output. [1]

.....

(b) Another error can result from incorrectly using the rules or grammar of the programming language.

(i) Name this error. .... [1]

(ii) State when this error is detected. [1]

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.....  
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6. (a) A software house encourages its programmers to use libraries when developing software.

Explain why it is good programming practice to use such libraries when developing computer programs. [4]

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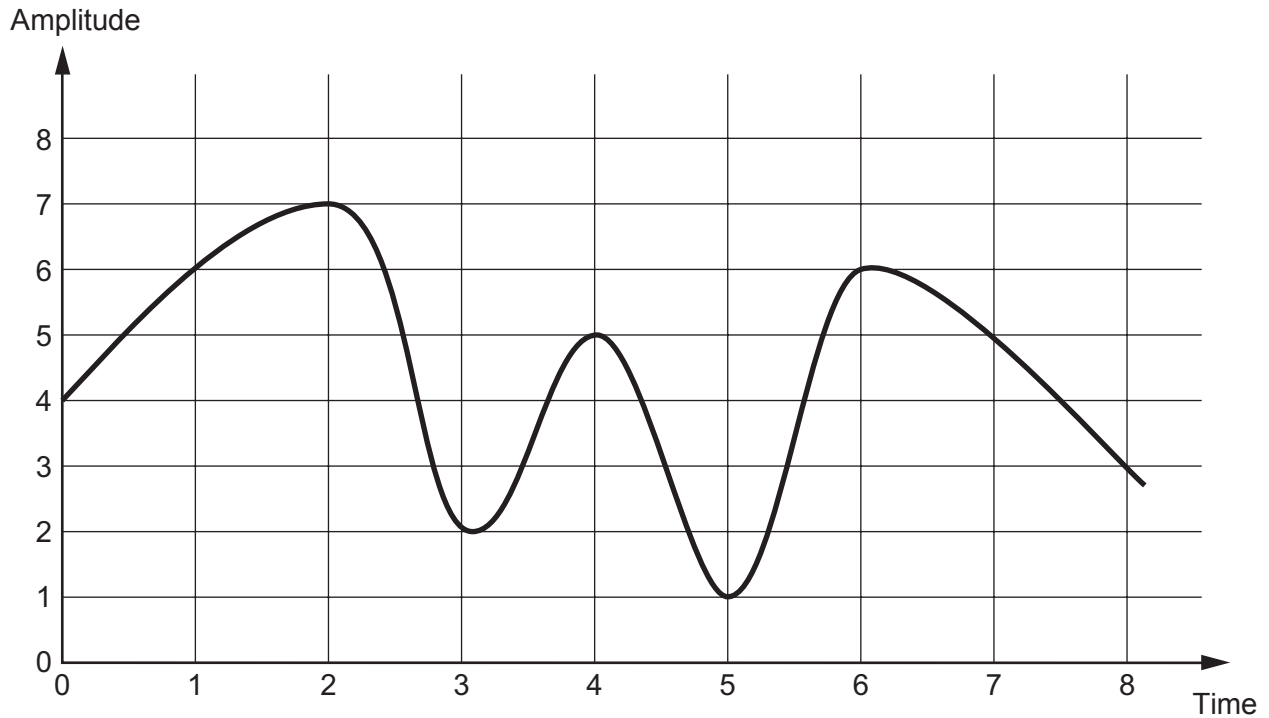
.....

(b) If a program calls a library routine that has not been loaded correctly an error occurs. Name this type of error. [1]

.....



7. Below is a representation of a simple sound wave. The wave is sampled every second and the amplitude is stored as a 4-bit binary number.



- (a) Complete the table below to show how the wave would be represented in binary. [5]

<b>Time</b>	1	2	3	4	5	6	7	8
<b>Amplitude</b>	6	7	2					3
<b>Binary</b>	0110	0111						0011

Use the space below for your workings.

- (b) (i) State the number of bits required to store the binary data from the completed table. [1]

.....

- (ii) Convert your answer from (b) (i) to bytes. [1]

.....





(c) Taking a sample every second produces a very poor quality sound. Explain how the sample rate could be altered to improve the sound quality. [1]

.....  
.....

(d) (i) If ten samples were taken every second, state the effect on the size of the file. [1]

.....

(ii) Calculate the number of bytes required to store the data for the wave when ten samples per second are taken. [2]

You **must** show your workings.

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.....  
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8. (a) Convert the denary number 162 to hexadecimal. Show your workings. [2]

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- (b) Convert the hexadecimal number 1E to denary. Show your workings. [2]

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9. Complete the following *Truth Table*. [4]

A	B	A OR B	NOT (A OR B)
1	1		
1	0		
0	1		
0	0		



10. Describe **four** features of the operating system when providing a graphical user interface on a personal computer. Give a suitable example of **each** feature. [8]

Feature 1 .....

.....

.....

Example .....

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Feature 2 .....

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Example .....

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Feature 3 .....

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Example .....

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Feature 4 .....

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Example .....

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11. Below is an algorithm.

```
Algorithm June2016  
  
M is integer  
P is integer  
i is integer  
  
startmainprog  
  
  input M  
  
  for i = 1 to 4  
    set P = i * M  
    output P  
  endfor  
  
endmainprog
```

Write down all the outputs produced by the algorithm when the value of M input is 3. [4]

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12. Below is an algorithm.

```

Total is ?      {stores the total of the numbers input}
Mean is ?      {stores the mean of the numbers input}
Count is ?     {stores the loop control value}

startmainprog

    set Total = 0  {initialise variables}
    set Count = 0

    repeat

        set Count = Count + 1
        set Total = Total + Count

    until Count = 20

    output "The total is ", Total

    set Mean = Total / 20
    output "Mean is ", Mean

endmainprog
    
```

The algorithm has three variables.

(a) State, giving a reason for each, the most suitable data type for the variables below. [4]

Variable: **Mean**

Data Type .....

Reason .....

.....

Variable: **Count**

Data Type .....

Reason .....

.....

(b) Some computer languages have local static variables that can only be declared inside a function. Describe the difference between a local variable and a local static variable. [2]

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.....

.....



13. Command Line Interfaces (CLI) are often used in the computer industry.

Describe who might use a CLI and give **three** reasons why they might choose to use a CLI. [4]

Who might use a CLI? .....

.....

Reason 1 .....

.....

.....

Reason 2 .....

.....

.....

Reason 3 .....

.....

.....



14. Image files can be stored on a computer using lossy or lossless compression.

(a) Compare lossy and lossless compression, in terms of their effect on quality and file size. [2]

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.....

(b) Give **three** reasons why image files are compressed. [3]

Reason 1 .....

.....

.....

Reason 2 .....

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Reason 3 .....

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(c) Give **two** examples of metadata that might be stored with an image. [2]

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15. A small business stores data about customers on its computer system.

Describe how the business ensures that only employees can access the network. Describe other security measures the business will have in place to limit how data is accessed by employees.

The business encrypts their data so it cannot be used by hackers even if they gain access to the network. Describe how the data could be encrypted and decrypted by the business.

Describe the procedures the business should have in place to recover data from a natural disaster. Explain how data would be recovered after a fire destroyed the hard discs holding all the customer data.

*Quality of written communication will be assessed in this question.*

[10 QWC]

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