The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (1)

Q1

Some CPUs have cache memory.

(i) Describe what is meant by cache memory.

(ii) Explain why cache memory is needed.

[4]

Q2

A shopkeeper needs software to manage the accounts of her shop. She decides to use off-the-shelf software instead of custom written software.

Describe **two** advantages to the shopkeeper of off-the-shelf software, compared to custom written software

Advantage 1

Advantage 2

Q3

Data stored in computers can be measured in bits, bytes and kilobytes.

(a) State what is meant by

(i) a bit

....

.... **[1]**

(ii) a byte

....

.... **[1]**

The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

Q4	A television set top box contains a database of television channels and programmes.

(a) Describe what is meant by a database.

....

.... **[2]**

Q5

A city has many libraries. Each library has several computers.

(a) All the computers in a library are connected to each other through a local area network (LAN) and the libraries are connected through a wide area network (WAN).

In the table below, tick **one** box in each row to show whether the statements are true for the LAN only or for both LAN and WAN.

	LAN only	Both LAN and WAN
This can be used to check the books in another library.		
This can be used to send messages between the libraries.		
This will include a printer where users can print results of a search.		
Protocols are needed to allow the computers to communicate.		

[4]

Q6

Debbie has a program on her mobile phone, which calculates the cost of the calls she has made.

The algorithm to update the data when a new text call is made is shown below

```
PROCEDURE Update
    TotalCalls = TotalCalls + 1
    IF SameNetwork = TRUE THEN
        RunningCost = RunningCost + 0.01
    ELSE
        RunningCost = RunningCost + (CallLength * 0.10)
    END IF
END PROCEDURE Update
```

So far TotalCalls = 10 and RunningCost = £12.00

(i) Debbie makes a 3 minute call to a phone on the same network.

State the values of TotalCalls and RunningCost after they have been updated using this algorithm.

TotalCalls =..

RunningCost =...**[2]**

(ii) Debbie now makes a 5 minute call to a phone on a different network.

State the values of TotalCalls and RunningCost after they have been updated using this algorithm.

TotalCalls =..

RunningCost =...**[2]**

The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (2)

Q1

(a) The table below contains statements about the functions of the CPU.

Tick **one** box in each row to show whether the statement is true or false.

	TRUE	FALSE
It performs arithmetic operations on data.		
If fetches and executes instructions		
Input and output devices are plugged into it		
It moves data to and from memory locations.		

[4]

Q2

Vimal is writing a program to convert the time from the 24 hour clock to the 12 hour clock.

Here is an extract from his program. This extract contains **two** errors.

```
IF (hours > 12) ADN (hours < 24) THEN
    hours = hours + 12
END IF
```

(a) Explain why there is an error in the **first** line, and state what type of error this is.

Explanation

....

....

Type of Error:... **[3]**

Q3

A file contains 5120 bytes. Calculate the size of the file in kilobytes.
You must show your working.

....

....

....

.... **[2]**

The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

| Q4 | Data about television channels are stored in the CHANNEL table. Part of this table is shown below. |

ChannelID	ChannelName	ChannelType	Broadcaster	HD
346	ETV News	News	ETV	False
347	Screen One	Movies	ETV	True
349	BLING one	General	Bling	True
350	Vivo	Documentary	ETV	False
351	Nature	Documentary	Bling	False
355	Screen One	Movies	Bling	True

State the primary key for the CHANNEL table and give a reason for your choice

Primary Key .... [1]

Reason

....

.... [1]

| Q5 | Some computers are available for public use.
Explain why the libraries need the following security measures.

User access levels

....

.... [2]

Firewalls

....

.... [2]

| Q6 | Debbie has a program on her mobile phone, which calculates the cost of the calls she has made.

(a) The program uses the following variables.

State the most appropriate data type for each variable.

Variable name	Purpose	Data type
Network	The name of the mobile phone network operator used (e.g. Toki Weka)	
CallLength	The length of a call made. (e.g. 1.5 for one and a half minutes)	
SameNetwork	Whether a call was made to a phone on the same network	
TotalCalls	The total number of calls made (e.g. 10)	
RunningCost	The calculated cost of all calls (e.g. £12.00)	

[5]

The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (3)

Q1

Data about television channels are stored in the CHANNEL table. Part of this table is shown below.

ChannelID	ChannelName	ChannelType	Broadcaster	HD
346	ETV News	News	ETV	False
347	Screen One	Movies	ETV	True
349	BLING one	General	Bling	True
350	Vivo	Documentary	ETV	False
351	Nature	Documentary	Bling	False
355	Screen One	Movies	Bling	True

Data about programmes that will be broadcast are stored in the PROGRAMME table. The data about each programme includes the channel on which it would be broadcast.

(i) Explain how a foreign key can be used to connect the PROGRAMME table to the CHANNEL table.

....

.... **[2]**

(ii) Explain why the programme data is stored in a separate table from the channel data.

....

.... **[3]**

Q2

Zak is writing a program that uses an array called WordList. This array contains 10 foreign words in alphabetical order. The contents of the array are shown below.

WordList (1)	akesi
WordList(2)	esun
WordList(3)	jaki
WordList(4)	kala
WordList(5)	lipu
WordList(6)	mama
WordList(7)	nasa
WordList(8)	olin
WordList(9)	taso
WordList(10)	walo

(a) The value of WordList(1) is "akesi".

Complete the following statements.

(i) The value of WordList(6) is ....

(ii) The value of WordList(.......) is "taso

[2]

Q3

A compiler and an interpreter are two different types of translator.

Describe **one** difference between a compiler and an interpreter.

....

.... **[2]**

The questions on this worksheet have been taken from the Original OCR GCSE Computing Specimen Paper

Q4	An artist is recording sound using a computer. The graph below represents the pressure wave of the sound being recorded.

At point A on the graph, the size of the sound wave is 90. This is stored digitally using the binary value of 0101 1010 (or 5A in Hex).

Complete the table below to show how points B and C are stored:

	Point A	Point B	Point C
Size	90		
Binary Value	0101 1010		
Hex Value	5A		

[6]

Q5
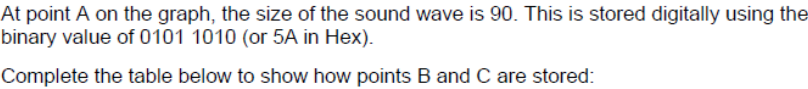
Explain why a program written in a high level language needs to be translated before it can be executed.

....

....

....

....

....

....**[3]**

Q6

Vimal is writing a program to convert the time from the 24 hour clock to the 12 hour clock.

Here is an extract from his program. This extract contains **two** errors.

```
IF (hours > 12) ADN (hours < 24) THEN
    hours = hours + 12
END IF
```

Explain why there is an error in the **second** line, and state what type of error this is.

Explanation

....

....

Type of Error:...**[3]**

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (4)

Q1	An advertisement for a personal computer is shown below.

An advertisement for a personal computer is shown below.

av systems
T-800 DELUXE

Ultra-fast QUAL processor
4GB RAM
320GB Hard Drive
DP Premier Home Edition
64-Bit operating system
+ PS Anti-Virus
CCS Graphix 3.0
WolfWeb High-Speed
Internet

(i) What is software?

....

.... [1]

(ii) Give one example of software from the advertisement.

....

.... [1]

Q2

) The table below contains a list of hardware devices.

Tick **one** box in each row to show what type of device it is.

The first one has been done for you.

Hardware device	Input	Output	Processing	Storage	Communication
Monitor		✓			
CPU					
Mouse					
DVD-Drive					
Speakers					

[4]

Q3

Mary's computer has an 800MHz CPU and 1GB of RAM.

(a) Describe the purpose of the CPU.

....

....

....

.... [2]

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

Q4	
	(b) Mary wants to upgrade this computer so that she can play the latest games.
	Explain two ways by which the computer can be upgraded to improve its performance.
	....
	....
	....
	....
	....
	....
	....**[4]**

Q5	
	(a) Convert the denary number 106 into an 8 bit binary number.
	....
	....
	....
	....**[2]**
	(b) Convert the denary number 106 into Hexadecimal.
	....
	....
	....
	....**[2]**

Q6	
	Peter takes a high resolution picture with a digital camera. The picture is stored in a bitmap file.
	(a) Describe how a picture is stored in a bitmap file.
	....
	....
	....
	....
	....
	....**[3]**

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (5)

Q1	Peter takes a high resolution picture with a digital camera. The picture is stored in a bitmap file.
	Peter wants to send the picture as an email attachment.
	State two methods for reducing the size of the picture file so that it is suitable for sending as an email.
	Method1
	....
	....
	Method 2
	....
	.... **[2]**

Q2	Ali's new computer uses a single-user, multi-tasking operating system.
	What is a **single-user** operating system?
	....
	....
	....
	.... **[2]**
	What is a **multi-tasking** operating system?
	....
	....
	....
	.... **[2]**

Q3	Ali's new computer uses a single-user, multi-tasking operating system.
	Discuss the utility programs Ali will need, justifying why he needs them.
	....
	....
	....
	....
	....
	....
	....
	....
	.... **[6]**

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

Q4	A classroom in a primary school has 6 stand alone computers. The school decides to connect them to form a LAN.

(a) What is a LAN?

....

.... **[1]**

(b) State two advantages of connecting the computers into a LAN.

Advantage 1 ....

....

Advantage 2 ....

.... **[2]**

Q5	Davinder is a music student. She needs to take her files from her home computer into college.

Identify a method of storage which is suitable for taking her music files into college.

....

....

State why this method is suitable.

....

.... **[2]**

Q6	A program includes the following code.

```
If A > B Then
    A = B
    B = A
End If
```

(a) The code uses the variables A and B.

Describe what is meant by a variable.

....

....

....

.... **[2]**

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (6)

Q1

A classroom in a primary school has 6 stand alone computers. The school decides to connect them to form a LAN.

The school decides to use the star topology to create the LAN.

Describe what is meant by a star topology. You may use a diagram.

....

....

....

.... **[2]**

Q2

A program includes the following code.

```
If A > B Then
    A = B
    B = A
End If
```

State the final values of the variables A and B if the values at the beginning of the code are

A = 4   B = 9

Final value of A = ...
Final value of B = ...

A = 6   B = 2

Final value of A = ...
Final value of B = ...

[2]

Q3

The intention of lines 02 and 03 is to swap the contents of the variables A and B. This does not work.

Rewrite the code so that the contents of the variables are swapped correctly.

....

....

....

....

....

.... **[3]**

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

Q4	A gym has many different types of exercise equipment. To use any equipment, members need to enter an individual 4-digit number. A computer system records how long each member has spent on each type of equipment and uses this information to charge the members.

Complete the table below with two input values which could be used to test that the computer system correctly checks that the member has entered their number correctly. For each item of test data

- Explain why it is used
- State the expected outcome

Test data	Reason for test	Expected outcome

[6]

Q5

The following logic circuit can be written as P = NOT (A AND B)

(a) State the output (P) of the circuit if the inputs are:

(i) A = 1   B = 0

P = ... [1]

(ii) A = 1   B = 1

P = ... [1]

Q6

Draw the logic circuit for P = (A OR B) AND C

[2]

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

6-A-Day – Computer Science GCSE (7)

Q1

11 A dentist uses a database to store the details of patients and their appointments.

(a) A database management system (DBMS) is used which includes forms, queries and reports.

Tick **one** box in each row to show whether each of the following statements best describes a form, a query or a report.

	Form	Query	Report
This can be used to print out all the appointments that the dentist has booked.			
This can be used to enter a patient's details when the patient registers with the dentist.			
This can be used to find out all the appointments that a certain patient has made.			

[3]

Q2

(b) When a patient makes an appointment, the start time of the appointment needs to be validated.

State two validation checks which can be carried out on the start time of the appointment.

Check 1 ....

....

Check 2 ....

....[2]

Q3

(c) Justify the use of separate entities to store the patient and appointment data.

....

....

....

....

....

....[3]

The questions on this worksheet have been taken from the Additional OCR GCSE Computing Specimen Paper

Q4

12 A display board can show a flashing message of up to 20 characters.

✳ ✳ ✳ ✳ ✳ ✳ ✳ WELCOME ✳ ✳ ✳ ✳ ✳ ✳

(a) A program allows users to input the message to be displayed and the number of times it should flash.

State the data type of each item of the input data.

Message ....[1]

Number of flashes .... [1]

Q5

(b) Write an algorithm for the program which:

- Allows the user to input the message and the number of flashes

- Rejects the message if it is longer than 20 characters and stops

- Otherwise it repeatedly displays the message and clears the display for the correct number of times.

....

....

....

....

....

....

....

....

.... [5]

Q6

State the purpose of the CPU.

....

.... [1]

6-A-Day – Computer Science GCSE (8)

Q1	Describe what is meant by 3MHz CPU .... [2] quad-core CPU .... [2]
Q2	A small business has three stand-alone computers, a printer and an internet connection in an office. (a) State **two** advantages of connecting the computers to create a local area network. 1 .... 2 .... [2]
Q3	Calculate the denary value of the 8-bit binary number 10010111. You must show your working. .... [2]

Q4

A desk-top computer's memory includes ROM and RAM.

Tick **one** box in each row to show whether each of the statements is true for ROM or RAM.

	ROM	RAM
Programs and data which are currently in use are loaded here.		
All the contents are lost when the power is turned off.		
It is used to boot up the computer when it is switched on.		

[3]

Q5

Karen wants to use handheld computers to take customers' orders in her restaurant. She is thinking of using custom written, open source software.

(a) State what is meant by custom written software.

....

.... [1]

(b) State **two** reasons why Karen may decide to use custom written software.

1. ....

....

2. ....

.... [2]

Q6

A teacher uses a database to store the marks of pupils from all year 9 classes.

(a) PUPIL and CLASS are two entities used in this database.

Explain the term entity.

....

....

....

.... [2]

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper

6-A-Day – Computer Science GCSE (9)

Q1	A shopping centre uses several remote-controlled CCTV cameras for security. An operator uses a computer to watch, control and record the output of the cameras. State an input, output and storage device which will be needed by the computer. For each, explain the reason why it is needed. Input device ....[1] Reason ....[2]
Q2	Output device: ....[1] Reason ....[2]
Q3	Storage device: ....[1] Reason ....[2]

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper

Q4	Karen wants to use handheld computers to take customers' orders in her restaurant. She is thinking of using custom written, open source software.
	Discuss the implications of creating open source software for the restaurant.
	The quality of written communication will be assessed in your answer to this question.
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	.... **[6]**
Q5	State what is meant by the character set of a computer.
	....
	.... **[1]**
Q6	State what is meant by a syntax error, giving an example.
	....
	....
	....
	.... **[2]**

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper

6-A-Day – Computer Science GCSE (10)

Q1

A teacher uses a database to store the marks of pupils from all year 9 classes. PUPIL and CLASS are two entities used in this database.

The data for the first four pupils in the PUPIL table is shown below.

PupilNumber	Surname	FirstName	ClassCode
A01	Adams	Michelle	9DK
A02	Ali	Mohammed	9BH
A03	Ali	Shirelle	9DK
A04	Azor	Michelle	9FT

(i) State the primary key for the PUPIL table and explain your answer.

Primary Key .... [1]

Explanation

....

....

....

.... [2]

Q2

The database also contains a CLASS table. The primary key for the CLASS table is ClassCode.

Explain why ClassCode has also been included in the PUPIL table.

....

....

....

....

....

.... [3]

Q3

Describe what is meant by an array.

....

....

....

.... [2]

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper
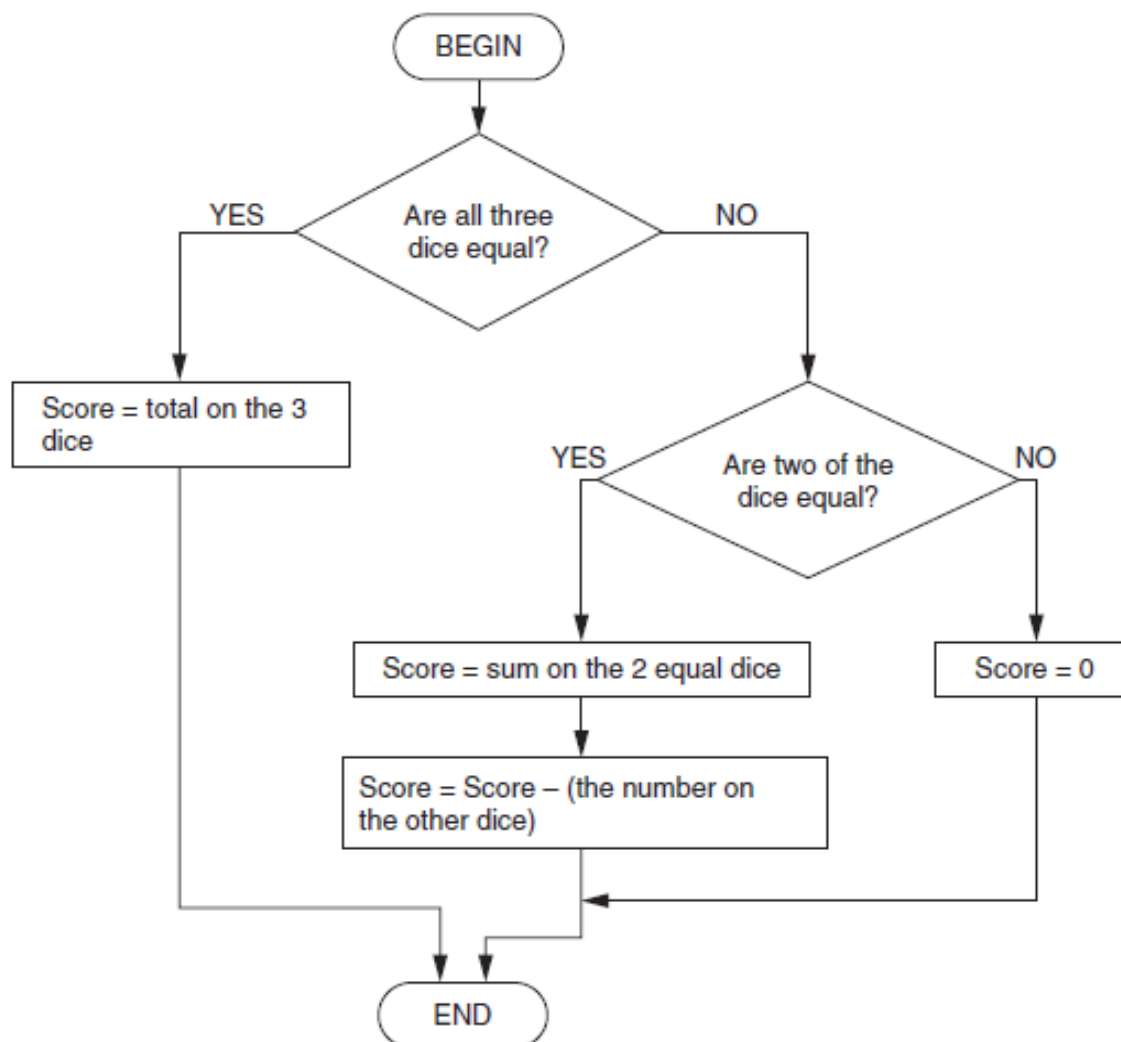
Q4	Describe tools and facilities available in an integrated development environment (IDE) which can help the programmer to identify and correct syntax errors. .... **[4]**
Q5	Explain how ASCII is used to represent text in a computer system. .... **[3]**
Q6	Unicode is also used to represent text in a computer system. Explain the difference between the character sets of Unicode and ASCII. .... **[2]**

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper

6-A-Day – Computer Science GCSE (11)

Q1

Frances is writing a program which simulates a dice game played with three ordinary 6-sided dice.

(a) When the player rolls the three dice, the player is given points according to the algorithm expressed in the flow diagram below.

BEGIN

Are all three dice equal?

YES → Score = total on the 3 dice

NO → Are two of the dice equal?

YES → Score = sum on the 2 equal dice

NO → Score = 0

Score = Score – (the number on the other dice)

END

State the value of the score if the dice rolled are

3 4 5   Score : ....

Q2

4 4 4   Score : ....

Q3

5 5 6   Score : ....

The questions on this worksheet have been taken from the OCR GCSE Computing January 2011 Paper

Q4	Some rolls of the dice result in a negative score.
	State a set of three numbers which can be used to test whether the algorithm produces a negative score when it should, and state the expected output for your test data.
	Set of test data: ....
	Expected output: .... **[2]**

Q5	When the dice are rolled, the results are stored in an array called DiceResult.
	For example, if the first dice shows a 5 then the value of DiceResult(1) becomes 5.
	State the data type and size of the array DiceResult giving a reason for each.
	Data type of DiceResult: ....
	Reason: ....
	....
	Size of array DiceResult: ....
	Reason: ....
	.... **[4]**

Q6	Computer technology has changed the ways in which teenagers interact with each other. Explain how developments in software and hardware have enabled new methods of communication among teenagers.
	The quality of written communication will be assessed in your answer to this question.
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....
	.... **[6]**

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

6-A-Day – Computer Science GCSE (12)

Q1	A small business has three stand-alone computers, a printer and an internet connection in an office.
	(b) Describe, using a diagram, how the computers can be connected to each other using a bus topology, stating what hardware will be needed.
	....
	....
	....
	.... **[6]**

Q2	Add the following two 8-bit binary numbers **and** explain the result. You must show your working.
	$$\begin{array}{r} 1\ 0\ 0\ 1\ 0\ 1\ 1\ 1 \\ +\ \underline{1\ 1\ 0\ 1\ 1\ 0\ 0\ 0} \\ \underline{} \end{array}$$
	....
	.... **[3]**

Q3	Karen wants to use handheld computers to take customers' orders in her restaurant. She is thinking of using custom written, open source software.
	State **two** reasons why Karen may decide to use custom written software.
	1. ....
	....
	2. ....
	.... **[2]**

Q4

The routine for rolling the dice is written as a sequence below.

```
BEGIN RollTheDice
    DiceResult(1) = Random Number between 1 and 6
    DiceResult(2) = Random Number between 1 and 6
    DiceResult(3) = Random Number between 1 and 6
END
```

Rewrite this routine so that it uses iteration.
You may use a diagram.

....

....

....

....

....

....

....

.... **[4]**

Q5

A grocery shop uses a database with a DBMS to keep records of its stock.

(a) Explain what is meant by a DBMS.

....

....

....

....

....

.... **[3]**

Q6

A rock band uses an internet website to advertise its music.

(a) The website uses HTML.

(i) Describe HTML.

....

....

....

.... **[2]**

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

6-A-Day – Computer Science GCSE (13)

Q1	State what is meant by a storage device, an input device and an output device in a computer system. Storage Device: .... Input Device: .... Output Device: .... **[3]**
Q2	The secondary school wants the computer systems to be more accessible to students with disabilities. Describe, with examples, input and output devices which are available for students with disabilities. The quality of written communication will be assessed in your answer to this question. .... **[6]**

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

Q3	Explain the importance of HTML in the creation of web pages. .... **[2]**
Q4	Explain the importance of compressing files when transmitting them via the internet. .... **[2]**
Q5	Describe the difference between lossy and lossless compression and give an example where each would be used. .... **[4]**
Q6	Draw the circuit diagram which will represent the circuit P = NOT (A AND B) [2]

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

6-A-Day – Computer Science GCSE (14)

Q1	The following logic circuit can be written as P = (NOT A) AND B
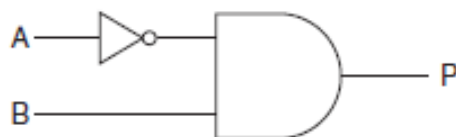
Complete the following truth table for the circuit given above.

A	B	P
0	0	0
0	1	
1	0	
1	1	

[3]

| Q2 | Describe the following types of common utility programs.
(a) Antivirus
....
....
....
.... [2] |
| --- | --- |

| Q3 | (b) Disk defragmenter
....
....
....
.... [2] |
| --- | --- |

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

Q4	Convert the hexadecimal number 6A to denary. You must show your working. .... **[2]**
Q5	Explain why hexadecimal numbers are often used to represent binary numbers. .... **[2]**
Q6	The data type of WheelSize is integer and the data type of Circumference is real number. Explain the difference between an integer and a real number. .... **[2]**

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

6-A-Day – Computer Science GCSE (15)

Q1	A program contains the following code to calculate the circumference of a bicycle wheel, using the wheel size (diameter).

```
BEGIN
    CONSTANT Pi = 3.14
    INPUT WheelSize
    Circumference = Pi * WheelSize
    OUTPUT Circumference
END
```

(a) The code uses one constant and two variables.

    (i) State the names of the constant and the variables.

    Constant: ....

    Variables: ....

                  [2]

Q2	Explain **one** difference between a constant and a variable.

....

....

....

.... **[2]**

Q3	Convert the hexadecimal number 6A to binary.

....

....

....

.... **[2]**

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

Q4	Convert the binary number 00111101 to hexadecimal. .... **[2]**
Q5	A list of file extensions for common file standards used on the internet is shown below. JPG PDF MP3 MPEG ZIP The rock band allows some files to be downloaded by fans. Complete the table below to show which file format **from the list given above** may be used for each of the following files.
Q6	Explain what is meant by a DBMS. .... **[3]**

Table for Q5:

File	File Format
A high resolution image of the band to use as a desktop background.	
Sheet music of their songs ready to be printed in the correct format for guitar players.	
A short video extract from their latest concert tour.	
A compressed collection of 200 plain text files containing the lyrics of all their songs.	
An audio recording of a song from their album.	

[5]

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

6-A-Day – Computer Science GCSE (16)

Q1	A secondary school is upgrading its computer equipment.

(b) Complete the table below to show whether magnetic, optical or solid state storage is most appropriate for each of the following uses. Give a reason for each case.
The first one has been done for you.

Use	Magnetic, optical or solid state	Reason why this is most appropriate
Storing pictures in a digital camera	solid state	Is not affected by the camera being moved around
Handheld device used by students for field work		
Storage drives on the school's main file server		
Videos of the school production to be given to parents		

[6]

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Q2	A grocery shop uses a database with a DBMS to keep records of its stock.

The database uses forms and reports.

Describe each of these and give **one** example of how it would be used in the shop's database.

Form

....

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.... [2]

Example

....

.... [1]

The questions on this worksheet have been taken from the OCR GCSE Computing June 2011 Paper

Q3	Report
	....
	....
	....
	.... [2]
	Example
	....
	.... [1]

Q4

Here is some data from the supermarket's database.

ProductID	Description	Supplier	Quantity Left	Reorder Level	Discontinued	Price
0001	6 eggs	Hill Farm	50	20	FALSE	£0.98
0002	2 litres of milk	Hill Farm	17	20	TRUE	£1.20
0003	1kg apples	Killey's	42	50	FALSE	£0.79
0004	250g butter	Hill Farm	12	25	FALSE	£0.49
0005	500g Moku Flakes	Moku Foods	0	10	TRUE	£0.99
0006	6 salad tomatoes	Killey's	30	30	FALSE	£0.89
0007	580g can baked beans	Moku Foods	27	30	FALSE	£0.42
0008	Family tomato ketchup	Moku Foods	41	20	FALSE	£1.45

(c) The shop runs queries using logical operators to select data for different purposes.

   (i) State the ProductID of the products in the above sample which fit the following criteria.

   Supplier = Killey's

   ....

   ....

   ....

Q5

Price > £1.00 OR Supplier = Hill Farm

....

....

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.... [4]

Q6

Write the criteria which can be used to select all products which are not discontinued and where the QuantityLeft is lower than the ReorderLevel.

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.... [3]

6-A-Day – Computer Science GCSE (17)

Q1	A dog that is 5 years old is equivalent to a 42 year old human. Ashok is writing a program which converts the age of a dog to the equivalent age for a human.

The program uses the following method:

- The user inputs age of the dog in years
- If the age is 2 or less, the human equivalent is 12 times the age
- If the age is more than 2, the human equivalent is 24 for the first 2 years, plus 6 for every additional year.

Write an algorithm to calculate and output the human equivalent of the age of a dog using the method described.

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.... [5]

Q2	Bytes, Kilobytes and Megabytes are units used for the amount of data stored in a computer.

(a) State which of these units is most appropriate for the following items of data.

A one page text document: ....

A ten minute movie clip: ....

A person's surname: .... [3]

Q3	Tick **one** box in each row to show whether each statement is true or false.

	TRUE	FALSE
The internet is the same as the World Wide Web		
The internet is a Local Area Network		
The internet is a network between many networks		

[3]

Q4	A large company with 200 employees uses a local area network (LAN) which includes all the computers in its head office.

Describe the security measures and network policies which can be used to safeguard the security and privacy of the company's data on the network.

The quality of written communication will be assessed in your answer to this question.

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.... [6] |
| Q5 | Peter takes a picture of himself and his friends to put on a social networking site. The picture is converted into pixels and stored as a bitmap file.

(a) Tick **one** box in each row to show whether or not each of the following items **must** be included in the bitmap file.

	Must be included	Need **not** be included
The names of the people in the picture		
The width of the picture in pixels		
The number of bits used for each pixel		
The number of people in the picture		
The colour of each pixel		

[5] |
| Q6 | What is meant by the resolution of the picture?

....

.... [1] |

6-A-Day – Computer Science GCSE (18)

Q1	A computer has a hard disk of 2 Terabytes. How much is this in Gigabytes? You **must** show your working. .... [2]
Q2	One of the functions of an operating system is multi-tasking. **(a)** Explain **one** reason why multi-tasking is needed in an operating system. .... [2]
Q3	**(b)** State **two other** functions of an operating system. 1 .... 2 .... [2]

Q4	A mail-order company buys dresses from America and France to sell in the UK.
	
	The company uses the following algorithm to convert sizes before printing them in its catalogue. Half sizes are not possible (e.g. size 12.5).
	
	``
	INPUT Size
	INPUT Origin
	IF Origin = "America" THEN
	      Size = Size + 2
	ELSE
	      IF Origin = "France" THEN
	            Size = Size - 26
	      END IF
	END IF
	PRINT Size
	``
	
	(a) The code uses the variables Origin and Size.
	
	    (i) Describe what is meant by a variable.
	
	....
	
	....
	
	....
	
	.... **[2]**

Q5	State the most appropriate data type for the variables Origin and Size, giving a reason for your choice. Origin Data type .... Reason ....
Q6	Size Data type .... Reason .... **[4]**

6-A-Day – Computer Science GCSE (19)

Q1

A mail-order company buys dresses from America and France to sell in the UK.

The company uses the following algorithm to convert sizes before printing them in its catalogue. Half sizes are not possible (e.g. size 12.5).

```
INPUT Size
INPUT Origin
IF Origin = "America" THEN
      Size = Size + 2
ELSE
      IF Origin = "France" THEN
            Size = Size – 26
      END IF
END IF
PRINT Size
```

The company sells the following dresses.

Dress A	**Dress B**	**Dress C**
Origin: France	Origin: America	Origin: UK
Size: 40	Size: 8	Size: 12

State the size which will be printed in the catalogue using the algorithm given.

Dress A ....

Dress B ....

Dress C .... **[3]**

Q2

How does the resolution affect the size of the bitmap file?

....

....

....

.... **[2]**

Q3

Describe the purpose of RAM in the computer.

....

....

....

.... **[2]**

| Q4 | A user types the address www.ocr.org.uk into a web browser.

Describe how a DNS server is used to access this website **and** explain the advantages of using DNS servers.

The quality of written communication will be assessed in your answer to this question.

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.... **[6]** |
|:---|:---|
| Q5 | Explain what is meant by virtual memory.

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.... **[2]** |
| Q6 | State why virtual memory is needed.

....

.... **[1]** |

6-A-Day – Computer Science GCSE (20)

Q1

Mrs Smith runs a dog sitting service that looks after dogs whose owners are going away on holiday.

Mrs Smith uses a database with two tables:
- The table DOG stores the following data about each dog: DogID, name, sex, weight, date of arrival, date of departure.
- The table JOB stores the daily jobs that she needs to do with each dog.

(a) The DOG table contains fields for the sex and weight of the dog.

    (i) Describe a validation check that can be done on the sex field.

    ....

    ....

    ....

    .... **[2]**

Q2

    (ii) Describe **a different** validation check that can be done on the weight field.

    ....

    ....

    ....

    .... **[2]**

Q3

A school uses a computer system to monitor the attendance, punctuality and homework of its pupils.

(a) Describe **two** ways in which modern computer technology can help the school monitor the pupils.

    1. ....

    ....

    ....

    ....

    2. ....

    ....

    ....

    .... **[4]**

Q4	The school has decided to use off-the-shelf software. **(i)** State **two** advantages of off-the-shelf software. 1 .... 2 .... **[2]**
Q5	**(ii)** State **two disadvantages** of off-the-shelf software. 1 .... 2 .... **[2]**
Q6	Mina's computer has 4GB of RAM. Mina upgrades the computer to 6GB of RAM. Explain how this upgrade will affect the performance of the computer. .... **[2]**

6-A-Day – Computer Science GCSE (21)

Q1	Mrs Smith runs a dog sitting service that looks after dogs whose owners are going away on holiday.

Mrs Smith uses a database with two tables:
- The table DOG stores the following data about each dog: DogID, name, sex, weight, date of arrival, date of departure.
- The table JOB stores the daily jobs that she needs to do with each dog.

An extract of the JOB table is shown below:

JobNumber	DogID	JobType	Time	Details
35	SM13	Feed	Morning	250g of Hundex
36	BA12	Walk	Afternoon	At least 30 minutes
37	SM13	Walk	Afternoon	Keep on leash
38	GH14	Other	Morning	Medicine: 1 tablet of Depucine
39	HT19	Other	Evening	Brush fur

(b) Explain why DogID has been included in this table.

....

....

....

....

....

.... **[3]**

Q2

Mrs Smith uses a query to select jobs using the following criteria:

(Time = "Afternoon") OR (Time = "Evening")

List the JobNumbers of the jobs that will be selected from the extract shown.

....

.... **[1]**

Q3

Mrs Smith wants to use database management software to create a report of all the jobs that she needs to perform on any given day, using data from the DOG and JOB tables.

In the space below, design a layout for the report.

6

Q4

The program in a vending machine uses an array called Coins to store the value in pence of all the coins that have been entered in the current sale.

A maximum of 10 coins can be entered in each sale.

After each sale, the array is reset so that all values are 0.

(a) Here is an example of the contents of the array Coins during a sale.

10	100	20	50	5	0	0	0	0	0

In the example above, the value of Coins(1) is 10.

State the value of

Coins(4) ....

Coins(10) .... **[2]**

Q5

(b) An algorithm to reset the contents of the array Coins after each sale is shown below. This algorithm contains a logic error.

```
i = 1
REPEAT
    Coins(i) = 0
    i = i + 1
UNTIL i = 10
```

(i) State what is meant by a logic error.

....

.... **[1]**

Q6

(ii) Explain why the algorithm above contains a logic error.

....

....

....

.... **[2]**

6-A-Day – Computer Science GCSE (22)

| Q1 | The program in a vending machine uses an array called Coins to store the value in pence of all the coins that have been entered in the current sale.

A maximum of 10 coins can be entered in each sale.

After each sale, the array is reset so that all values are 0.

(a) Here is an example of the contents of the array Coins during a sale.

| 10 | 100 | 20 | 50 | 5 | 0 | 0 | 0 | 0 | 0 |

In the example above, the value of Coins(1) is 10.

Write an algorithm to calculate the total value of the coins entered in the current sale using the contents of the array Coins.

....
....
....
....
....
....
....
....
....
.... **[5]** |
|----|----|
| Q2 | The following diagram shows how the computers in Mr Singh's office are connected to each other to form a LAN.

workstation   workstation   server   printer   Device A   internet
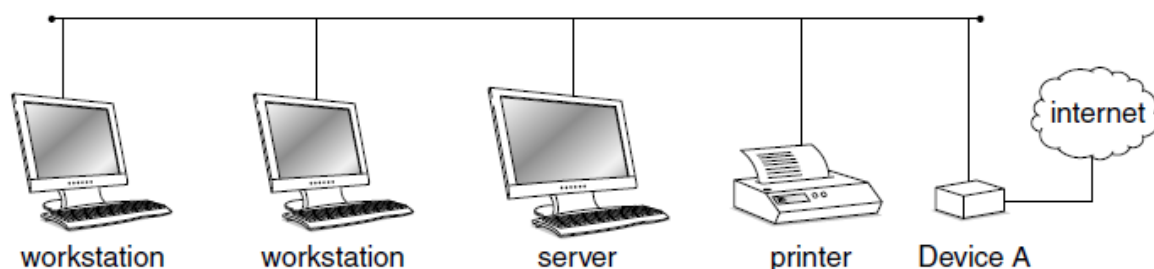
(a) State the correct name for this network topology.

.... **[1]** |
| Q3 | State the name of the Device A which connects the server to the internet.

.... **[1]** |

Q4	A school uses a computer system to monitor the attendance, punctuality and homework of its pupils.
	Explain how the school might address any legal issues when creating a system which stores personal data about pupils.
	The quality of written communication will be assessed in your answer to this question.
	....
	....
	....
	....
	....
	....
	....
	....
	....
	....**[6]**
Q5	The table below shows different standard file formats that are used to transmit media files on the internet.
	Tick **one** box in each row to show whether the format is used to transmit an image file, a sound file or a video file.

	image file	sound file	video file
AVI			
BMP			
JPG			
MP3			

[4]

Q6	Convert the denary number 55 to an 8 bit binary number.
	....
	....
	....
	....**[2]**

6-A-Day – Computer Science GCSE (23)

Q1	A tablet computer can be used to surf the Internet, read and reply to emails and watch on-line movies.

(a) In the table below, tick **one** box in each row to show whether each of the following is an output device or not.

	is an output device	is **not** an output device
Screen		
USB Port		
Speaker		

[3]

Q2	In his home, Mr Singh has a peer-to-peer network.

Explain what is meant by a peer-to-peer network.

....

....

....

.... **[2]**

Q3	Describe how the following system maintenance utilities are used.

System cleanup

....

....

....
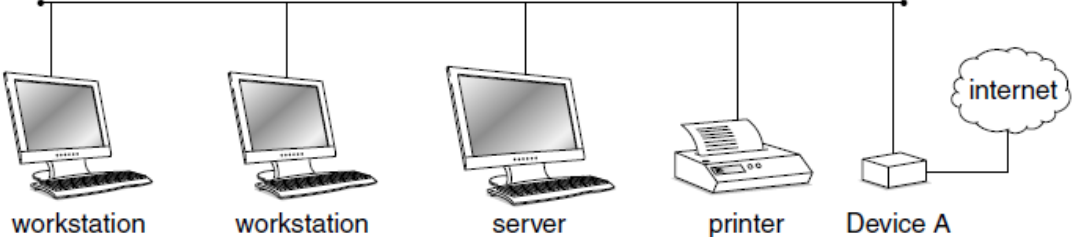
....[2]

Q4	Convert the denary number 55 to hexadecimal.
	....
	....
	....
	.... [2]
Q5	The CPU is the component which does most of the data processing in a computer.
	(a) State **two** tasks which are carried out by the CPU when processing data.
	1 ....
	....
	2 ....
	.... [2]
Q6	State what the initials DBMS stand for.
	.... [1]

6-A-Day – Computer Science GCSE (24)

Q1	A tablet computer has built-in input devices.
	Identify **two** input devices that can be built into a tablet computer and for each state how it could be used to input data.
	Device 1 ....
	How it could be used ....
	....
	....
	Device 2 ....
	How it could be used ....
	....
	.... **[4]**
Q2	The following diagram shows how the computers in Mr Singh's office are connected to each other to form a LAN.
	workstation workstation server printer Device A
	Give **three** functions of the server in this network.
	1 ....
	....
	2 ....
	....
	3 ....
	.... **[3]**
Q3	Describe how the following system maintenance utilities are used.
	Automatic update
	....
	....
	....
	.... **[4]**

Q4	Explain how the clock speed and the cache size of a CPU affect its performance.
	Clock speed
	....
	....
	....
	.... **[2]**
Q5	The memory of a computer contains data and instructions in binary.
	(a) Explain why computers use binary.
	....
	....
	....
	.... **[2]**
Q6	Describe how instructions are stored in binary.
	....
	....
	....
	....
	....
	.... **[3]**

6-A-Day – Computer Science GCSE (25)

Q1	Describe the features of a DBMS that can be used to create customised data handling applications and explain why using a DBMS is desirable. The quality of written communication will be assessed in your answer to this question. .... **[6]**
Q2	A games developer is developing an online game that can be played on games consoles, desktop computers or mobile phones. **(a)** The program is written in high-level code and then translated to machine code. Describe **two** differences between high-level code and machine code. 1 .... 2 .... **[4]**
Q3	State the name of **a different type** of translator, other than an interpreter, which can be used to translate high-level code to machine code. .... **[1]**

Q4	A taxi uses a computer to communicate with central office and to calculate customers' fares.
	(a) The program in the computer uses sequence, selection and iteration.
	State whether the operations below use **sequence**, **selection** or **iteration**.
	Performing a series of different set-up operations when the computer is switched on.
	....
	Beeping repeatedly after a message is sent, until the driver presses a button to show that the message has been read.
	....
	Deciding whether to use the DayTimeRate or the EveningRate functions to calculate a customer's fare.
	....**[3]**
Q5	**(b)** The computer measures the distance travelled as a real number and then rounds it up to the next integer.
	State what is meant by
	a real number
	....
	....
	an integer
	....
	....**[2]**
Q6	The following symbols are used to create logic circuits.
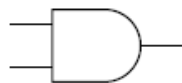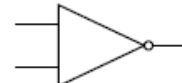
AND   OR   NOT

Complete the following logic circuit by filling in the blanks. The first one has been done for you.
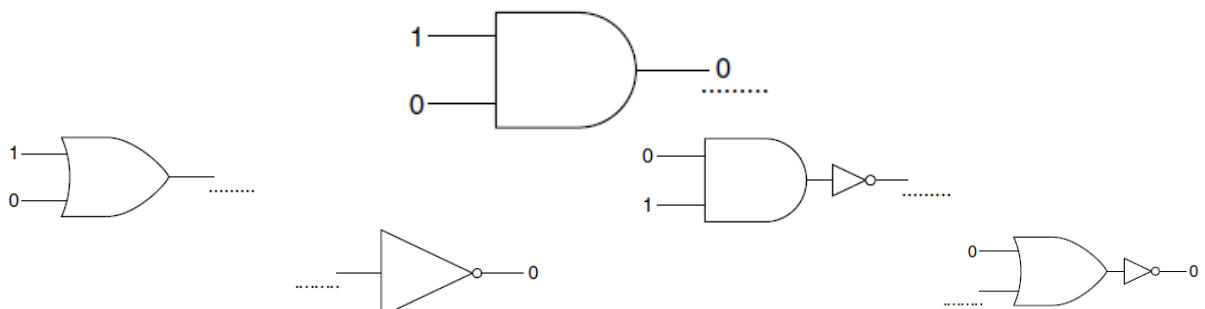
6-A-Day – Computer Science GCSE (26)

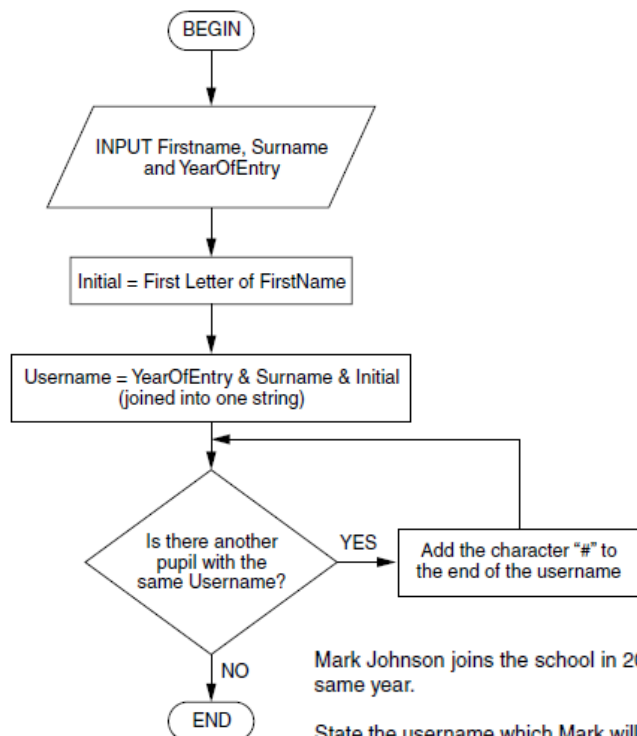|	
Q1	Explain how the clock speed and the cache size of a CPU affect its performance.

Clock speed

....

....

....

....

Cache size

....

....

....

.... **[4]**

Q2	A school uses a computer program to give every new pupil a username for logging onto computers.

The algorithm used to choose the username is shown below.


```
BEGIN

INPUT Firstname, Surname
and YearOfEntry

Initial = First Letter of FirstName

Username = YearOfEntry & Surname & Initial
(joined into one string)

Is there another          YES     Add the character "#" to
pupil with the                    the end of the username
same Username?

NO

END
```

Mark Johnson joins the school in 2012. No other pupil called Johnson joins the school in the same year.

State the username which Mark will be given and explain how you obtained your answer from the flow diagram.

Username ....

Explanation ....

....

....

.... **[3]**

Q3	A pupil has the username 2010alim###. State **four** facts that we can work out from this username. 1 .... 2 .... 3 .... 4 .... **[4]**
Q4	One type of translator which can be used is an interpreter. **(i)** Describe how an interpreter translates the high-level code to machine code. .... **[2]**
Q5	The cost of a day-time journey is £3 for the first kilometre and £2 for every kilometre after that. If there are five or more passengers in the taxi, an extra 50% is added to the charge. Write an algorithm to calculate the cost of a day-time journey. Your algorithm should: • allow the number of passengers and the distance of the journey to be input as whole numbers, • calculate the cost of the journey, • output the cost that has been calculated. **[7]**
Q6	State what is meant by a Boolean Data Type. [2]

6-A-Day – Computer Science GCSE (27)

Q1	Explain, with examples, why a large team of programmers need to agree standards when developing the game. The quality of written communication will be assessed in your answer to this question. .... **[6]**
Q2	Add the following bytes. $$\begin{array}{r} 1 \quad 1 \quad 0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \\ + \; 0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \\ \hline \end{array}$$ **[2]**
Q3	State the problem that will occur if a computer is to store the result as a byte. .... **[1]**

| Q4 | A website is made up of different types of files.

State what each of the file types in the table below is used for.

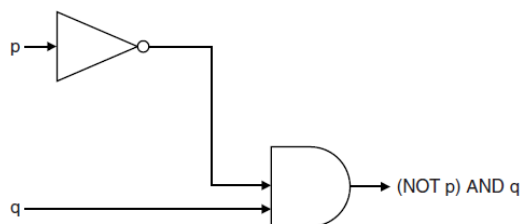| File type	Use
HTML	
JPG	
MP3	
PDF	

[4] |
|---|---|
| Q5 | State the output of each of the following logic circuits for the inputs given.
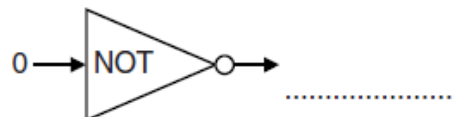
[2] |
| Q6 | Fig. 1 is a circuit diagram.

Fig. 1

Complete the truth table for Fig. 1.

p	q	(NOT p) AND q
0	0	0
1	0	0

[3] |

6-A-Day – Computer Science GCSE (28)

Q1	Most computer systems use at least one storage device. (a) Explain **one** reason why a secondary storage device is needed in most computer systems. .... **[2]**
Q2	A school has all of its computers in a local area network (LAN). (a) State **two** benefits of a LAN. 1 .... 2 .... **[2]**
Q3	Explain **two** measures which the school will need to take to ensure the security of the network. 1 .... 2 .... **[4]**

Q4	Explain the effect of the sampling interval on the size and quality of the sound file recorded. .... **[3]**
Q5	The accident and emergency department of a hospital uses a computer system to decide the order in which patients are treated. Describe advantages of using a computer system instead of a person to decide the order, and the need for this system to be reliable. The quality of written communication will be assessed in your answer to this question. .... **[6]**
Q6	Explain why data is stored in computers in a binary format. .... **[2]**

6-A-Day – Computer Science GCSE (29)

Q1

Some secondary storage devices are magnetic and others are solid state.

Describe the characteristics of magnetic and solid state secondary storage.

The quality of written communication will be assessed in your answer to this question.

....

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....

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....

.... **[6]**

Q2

Describe how sampling is used when storing sound.

....

....

....

.... **[2]**

Q3

State how the ASCII character set is used to represent text in a computer.

....

.... **[1]**

Q4	In the ASCII character set, the character codes for the first three capital letters are given below.

Letter	ASCII character code
A	0100 0001
B	0100 0010
C	0100 0011

Convert the word CAB into binary using the ASCII character set.

....

.... [1]

Q5	

Describe what is meant by a logic error.

....

....

....

.... [2]

Q6	

State **two** functions of the operating system.

1 ....

....

2 ....

....

[2]

6-A-Day – Computer Science GCSE (30)

Q1

In the ASCII character set, the character codes for the first three capital letters are given below.

Letter	ASCII character code
A	0100 0001
B	0100 0010
C	0100 0011

(b) The program uses the letters in the following list to represent musical notes.

C D E F G A B

When the user inputs a letter from this list, the program outputs the next three notes in the list. If it gets to the end of the list, it starts again from the beginning, so the next note after B is C.

Complete the test plan below by stating, for each input data, the expected outcome and a reason for the test.

Input Data	Expected outcome	Reason for test
C	....	....
A	....	....
H	....	....

[6]

Q2

Explain why the ASCII character set is **not** suitable for representing text in all the languages of the world.

....

....

....

.... [2]

Q3

Describe what is meant by open source software.

....

....

....

.... [2]

Q4

The table below shows some of the utilities in Amin's computer.

Tick **one** box in each row to show whether the utility is used for security or disk organisation.

Utility	Used for security	Used for disk organisation
Antivirus		
Defragmenter		
File transfer		
Firewall		

[4]

Q5

Describe what is meant by a database.

....

.... [2]

Q6

When a person joins the website, they need to enter some personal data which is validated using rules. For example, the date of birth must be in the past.

State **one** rule that could be used when validating each of the following.

Email address

....

....

Gender

....

....

Password

....

.... [3]

6-A-Day – Computer Science GCSE (31)

Q1	Each user can upload several pictures. Each picture has a date and a comment. The personal data of users is stored in a table called USER. The data about the pictures is stored in a separate table called PICTURE. Explain why the data about the pictures should be in a separate table, and how the tables can be linked. .... **[4]**
Q2	Jim is writing a program to calculate the wages of workers in a teddy bear factory. **(a)** Jim uses an Integrated Development Environment (IDE) to create the program. Describe **two** tools in an IDE that can help Jim when creating the program. 1 .... 2 .... **[4]**
Q3	State **one** difference between ROM and RAM, other than the size and the purpose. .... **[1]**

Q4

Workers sometimes get a £50 bonus.

Here is the algorithm used to calculate whether a worker should get a bonus.

```
Limit = 200
INPUT WagesEarned
IF WagesEarned < Limit THEN
    Pay = WagesEarned
ELSE
    Pay = WagesEarned + 50
END IF
```

State the value of Pay after this code is executed for each of the following values of WagesEarned.

WagesEarned = 50   Pay = ...

WagesEarned = 200   Pay = ...

[2]

Q5

The wages earned by a worker is either £2 for every teddy bear they have made or £5 for every hour they have worked, whichever is larger.

Write an algorithm that:
- allows the user to input the number of teddy bears made and the number of hours worked
- calculates the wages for the number of teddy bears made
- calculates the wages for the number of hours worked
- outputs the larger of the two results.

....

....

....

....

....

....

....

....

....

.... [6]

Q6

Convert the binary number 01101001 to denary, showing your working.

....

....

....

.... [2]

6-A-Day – Computer Science GCSE (32)

Q1

Here are some statements about the CPU of a computer.
Tick **one** box in each row to show whether each of the following statements is true or false.

Statement	True	False
CPU stands for Central Processing Unit.		
The CPU fetches and decodes instructions.		
The speed of a CPU is usually measured in GigaHertz (GHz).		
If a CPU has many cores, this slows down the computer.		
The hard disk drive is part of the CPU.		

[5]

Q2

A game console and a desktop computer are two different types of computer system.

Describe how a game console is similar to a desktop computer, with reference to input, output and storage.

The quality of written communication will be assessed in your answer to this question.

....

....

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....

....

....

....

....

....

....

....

....

.... [6]

Q3

State the purpose of an **input** device in a computer system.

....

.... [1]

Q4	Convert the denary number 154 to binary.
	....
	....
	....
	.... **[2]**
Q5	Julie is writing a computer game that simulates a 100 m race. Each time the space bar is pressed, the position of the player moves up by 1. When the position reaches 100, the player has won.
	Here is Julie's algorithm for the program
| | ```
CONST PlayerKey = " "
Position = 0
REPEAT
  INPUT KeyPressed
  If KeyPressed = PlayerKey THEN
    Position = Position + 1
  END IF
UNTIL Position = 100
``` |
	(a) State an example of a constant and a variable in the algorithm above.
	Constant ....
	Variable ....
	[2]
Q6	State what is meant by selection and iteration using examples from Julie's algorithm.
	Selection ....
	....
	Example ....
	....
	Iteration ....
	....
	Example ....
	....
	[4]

6-A-Day – Computer Science GCSE (33)

Q1	Bob's computer has 512 kilobytes of ROM and 8 gigabytes of RAM. (a) State how many bytes are in a kilobyte and a gigabyte. a kilobyte .... a gigabyte .... [2]
Q2	(b) (i) Describe the purpose of the ROM in Bob's computer. .... (ii) Describe the purpose of the RAM in Bob's computer. .... [4]
Q3	State the purpose of an **output** device in a computer system. .... [1]

Q4

An MP3 player contains a database of songs. This database has only one table.

A sample of the data in this table is shown below.

TrackNo	Artist	Song	Length	TimesPlayed	Protected
001	Dave Eade	Holidays	3.7	3	True
002	Tail	Seeing You	2.7	0	True
003	Dave Eade	Truly Cool	4	11	False
004	Aries	Love	1.9	0	True
005	MC Nail	Skit	0.4	0	False
006	The Flies	Skit	0.6	4	False
007	MC Nail	Game Over	2.7	1	True

(a) State the most appropriate data type for each of the fields shown below.

Field	Data type
Song	
Length	
TimesPlayed	
Protected	

[4]

Q5

(b) The mp3 player allows users to create playlists by using queries.

For example if the query used is

Artist = "Dave Eade"

the mp3 player will play tracks number 001 and 003.

(i) State the TrackNo of the songs that will be played using each of the following queries.

....

....

Q6

(Artist = "MC Nail") OR (Protected = False)

....

....

(Song = "Skit") AND (TimesPlayed > 0)

....

....

[3]

6-A-Day – Computer Science GCSE (34)

Q1

The security code for an alarm system is a long binary number which begins

10001111100101111011 …

The technicians prefer to use hexadecimal to enter the security code.

(i) When the number is converted into hexadecimal, the first two digits are 8F as shown below.

Complete the gaps to show the next three digits.

Binary:	1000	1111	1001	0111	1011
Hexadecimal:	8	F	....	....	....

[3]

Q2

(ii) Explain why the technicians prefer to use hexadecimal.

....

....

....

.... [2]

Q3

A railway company uses a computer terminal in the train station to sell train tickets.

Customers input their destination using a touch screen, pay by card and receive a printed ticket and receipt.

Describe **two** ways that the hardware in the computer terminal can be adapted so that blind customers can use it.

1 ....

....

....

....

2 ....

....

....

....

[4]

Q4	An MP3 player contains a database of songs. This database has only one table.

A sample of the data in this table is shown below.

TrackNo	Artist	Song	Length	TimesPlayed	Protected
001	Dave Eade	Holidays	3.7	3	True
002	Tail	Seeing You	2.7	0	True
003	Dave Eade	Truly Cool	4	11	False
004	Aries	Love	1.9	0	True
005	MC Nail	Skit	0.4	0	False
006	The Flies	Skit	0.6	4	False
007	MC Nail	Game Over	2.7	1	True

Write down the query that will select all songs over 2.5 minutes, which have never been played.

....

....

....

[3]

Q5

The mp3 player can be connected to a computer from which songs can be added. The computer has a relational database with many tables.

Explain, using an example, what is meant by an entity and how entities relate to the tables.

....

....

....

....

....

....

....

.... [4]

Q6

State what is meant by compression.

....

.... [1]

6-A-Day – Computer Science GCSE (35)

Q1

Julie is writing a computer game that simulates a 100m race. Each time the space bar is pressed, the position of the player moves up by 1. When the position reaches 100, the player has won.

Here is Julie's algorithm for the program

```
CONST PlayerKey = " "
Position = 0
REPEAT
  INPUT KeyPressed
  If KeyPressed = PlayerKey THEN
    Position = Position + 1
  END IF
UNTIL Position = 100
```

To make the game more interesting, Julie changes the rules. Each time the spacebar is pressed, the position of the player will now move up by a random number.

State **two** changes that need to be made to include this new rule. Justify each change.

Change 1 ....

....

Justification ....

....

Change 2 ....

....

Justification ....

....

[4]

Q2

State **one** advantage of compressing files before sending them over the internet.

....

.... **[1]**

Q3

Describe the difference between off the shelf and custom written software.

....

....

....

.... **[2]**

Q4

Two types of compression are lossy and lossless.

State which type of compression is most appropriate for each of the following and explain why it is appropriate.

(i) Downloading the source code of a large program

Type of compression ....

Explanation ....

....

....

.... [3]

Q5

(ii) Streaming a large video file

Type of compression ....

Explanation ....

....

....

.... [3]

Q6

Describe the difference between proprietary and open source software.

....

....

....

.... [2]

6-A-Day – Computer Science GCSE (36)

Q1	Explain the legal issues that the school should consider when choosing the software for managing pupils' attendance and examinations. The quality of written communication will be assessed in your answer to this question. .... [6]
Q2	Describe what is meant by a Local Area Network (LAN). .... [2]
Q3	A computer has 1024 megabytes of RAM. (a) How many gigabytes of RAM does the computer have? .... [1]

Q4	An isosceles triangle is a triangle that has at least two equal sides. The diagram below shows examples of isosceles triangles. In each diagram the marked sides are equal.

Write an algorithm for a computer program that determines whether a triangle is an isosceles triangle.

- The user inputs the lengths of the three sides as Length1, Length2 and Length3
- If any two sides have the same length the program outputs "Isosceles"
- Otherwise the program outputs "Not Isosceles"

....

....

....

....

....

....

....

....

....

.... **[5]** |
| Q5 | Add the following two 8-bit binary numbers.

| 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |

[2] |
| Q6 | An overflow error can occur when adding two 8-bit binary numbers.

Describe what is meant by an overflow error.

....

....

....

.... **[2]** |

6-A-Day – Computer Science GCSE (37)

Q1	Zoe plans to use the star topology in the LAN. Describe the star topology. You may use a diagram. .... [2]
Q2	State **two other** topologies that can be used when creating a LAN. 1 .... 2 .... [2]
Q3	State **two** items that will be stored in the RAM. 1 .... 2 .... [2]

| Q4 | The Nena mountaineering club has a web page. The web page consists of an HTML file and some JPG and MPEG files.

(a) What does HTML stand for?

....

.... [1] |
|---|---|
| Q5 | Explain **one** purpose of the HTML file.

....

....

....

.... [2] |
| Q6 | State the purpose of the following file types:

JPG ....

....

MPEG ....

....

[2] |

6-A-Day – Computer Science GCSE (38)

Q1	The computer sometimes uses virtual memory. Describe what is meant by virtual memory **and** state why it is needed. .... **[3]**
Q2	Apu has a handheld e-book reader that allows him to store and read electronic books. (a) State **one** input and **one** output device that can be built into the e-book reader to allow users to read books. Input device .... Output device .... **[2]**
Q3	Describe what is meant by proprietary software. .... **[2]**

Q4

The following logic diagram shows the expression NOT (a AND b).

Complete the missing boxes in the truth table below to show the value of NOT (a AND b) that will be output for each possible set of values of a and b.

a	b	NOT (a AND b)
0	0	1
0		1
1	0	

[4]

Q5

If 62 is a hex number, calculate its value as a denary number.

You **must** show your working.

....

....

....

.... [2]

Q6

If 62 is a denary number, calculate its value as a hex number.

You **must** show your working.

....

....

....

.... [2]

6-A-Day – Computer Science GCSE (39)

Q1	When customers pay using a card such as the one below, shops use computer systems to process the payment.

Tomomani Bank

Card number:
0000 0123 4567 7910

Owner:
MR A N OTHER

Valid from: 06/13   Valid to: 05/18

(a) Tick **one** box in each row, to show which of the data types given is the most appropriate data type for each of the following data items.

Data item	Date	Integer	Real	String
The amount paid				
The customer's card number				
When the payment is made				

[3]

Q2	*Produce a bullet point plan for your essay answer*	Explain why it is important for computer systems that process card payments to be reliable.

The quality of written communication will be assessed in your answer.

....

....

....

....

....

....

....

....

....

....

.... [6]

Q3	Julian buys a new laptop with a system information utility and a diagnosis utility.

Describe, using examples, the purpose of the system information and diagnosis utilities.

System information utility

....

....

Example

....

....

Q4	
	Diagnosis utility .... Example .... **[4]**
Q5	Types of secondary storage devices are magnetic, optical or solid state. (i) State which type of storage is most suitable for storing the electronic books inside the e-book reader. .... **[1]** (ii) Explain **one** reason why this type of storage is the most suitable. .... **[2]**
Q6	Apu gets a free e-book on a CD-ROM from a magazine. (i) Give **two** reasons why a CD-ROM is suitable in this case. 1 .... 2 .... **[2]** (ii) State whether a CD-ROM is magnetic, optical or solid state storage. .... **[1]**

6-A-Day – Computer Science GCSE (40)

Q1	Explain why people sometimes use hex numbers to represent numbers stored in computers, even though computers do not use hex numbers. .... **[3]**
Q2	Santos is writing a program that guesses the number of goals a team will score in a football match. The algorithm for his program is shown below: ``` 01 CONST Noise = 10 02 INPUT Wins 03 INPUT Losses 04 Goals = 0 05 Net = Wins - Losses 06 WHILE Net > Noise 07 Goals = Goals + 1 08 Net = Net - Noise 09 END WHILE 10 OUTPUT Goals ``` **(a)** State what is meant by a constant and give an example from the algorithm above. ....**[2]**
Q3	State what is meant by a variable and give an example from the algorithm above. ....**[2]**

Q4

State the number of goals that will be output by this algorithm for the following inputs. Explain how you obtained your answer in each case.

Wins = 30   Losses = 25

....

....

....

....

....

.... **[2]**

Q5

Wins = 20   Losses = 5

....

....

....

....

....

.... **[3]**

Q6

Define the term database.

....

.... **[1]**

6-A-Day – Computer Science GCSE (41)

Q1

A school uses a database, which stores the attendance data of the pupils. The data is entered by teachers using a desktop data application and accessed by parents using a web page or mobile phone application.

Explain **one** benefit of separating the data from the applications that use the school's attendance database.

....

....

....

....

....

.... **[3]**

Q2

The school uses a database management system (DBMS) to separate the data from the applications that use it.

Describe **one** example of how each of the following features of a DBMS can be used in the school's attendance database.

The ability to run queries

....

....

....

.... **[2]**

Q3

The ability to set validation rules

....

....

....

.... **[2]**

Q4	A typical smart phone is a computer system with input, output and storage devices.

State **one** input device, **one** output device and **one** secondary storage device that are built into a smart phone.

Input device ....

Output device ....

Storage device ....

[3]

Q5	The website of a school allows visitors to download JPG, MP3, MPEG and PDF files.

(a) The table below describes the content of four files that can be downloaded from the website.

Complete the table using the file types above, identifying the **most suitable** file type for each item. You may use a file type more than once if appropriate.

Content	Type of file
An image showing a map of the school	
A text document containing information for parents about the school rules	
A high resolution picture of all the staff and pupils	
A short video clip of some pupils saying why they like the school	

[4]

Q6	The video clip is compressed using lossy compression.

Explain why lossy compression is suitable for a video clip, but not suitable for a text document.

....

....

....

....

....

....

....

....

.... [3]

6-A-Day – Computer Science GCSE (42)

Q1

A computer program calculates the correct dose in grams of a type of medicine.

The algorithm used is shown by the flow diagram below.

The data type of the variable Age is Integer.

State the data type of the following variables used in the flow diagram.

Variable	Data Type
Gender	
Dose	
isPregnant	

[3]

Q2

Use the flow diagram to calculate the correct dose of medicine for a male aged 30.

You must show your working.

....

....

....

....

....

.... **[3]**

Q3

Use the flow diagram to calculate the correct dose of medicine for a pregnant female aged 19.
You must show your working.

....

....

....

....

....

....

.... **[4]**

Q4	Security on a computer can be provided directly by the operating system or by using utility programs. **(a)** Utility programs include antivirus, file transfer, firewall and system cleanup. State which **two** of these utilities can be used for security. 1 .... 2 .... **[2]**
Q5	Identify and describe **two** methods by which the operating system can provide additional security directly. 1 .... 2 .... **[4]**
Q6	Describe what is meant by High level code .... [2]

6-A-Day – Computer Science GCSE (43)

Q1	Describe what is meant by Machine code .... **[4]**
Q2	Graeme is a freelance programmer. He has written a program for a client and gives the client both the high level code and the machine code of the program. State why Graeme needs a compiler. .... **[1]**
Q3	*Produce a bullet point plan for your essay answer* Graeme hires a small team of programmers to work with him on larger projects. Describe the standards that Graeme and his team should apply to the code they produce, justifying why these standards are needed. *The quality of your written communication will be assessed in your answer.* .... **[6]**

Q4	A hairdresser uses a relational database to keep records of his clients and their appointments. The hairdresser uses off-the-shelf data-handling software to manage the database.
	(a) State what is meant by off-the-shelf software.
	....
	.... **[1]**
Q5	**(b)** Describe how the data-handling software can be used to set up the structure of the database, before any data is added.
	....
	....
	....
	....
	....
	.... **[3]**
Q6	**(c)** State **two** tasks the hairdresser can perform using the data-handling software, once the database is in use.
	1 ....
	....
	....
	....
	2 ....
	....
	....
	....
	[2]

6-A-Day – Computer Science GCSE (44)

Q1	Dipesh is thinking of buying a tablet computer to replace his old desktop computer. (a) Describe how the CPU and RAM work together to enable the tablet computer to operate. .... [3]
Q2	The tablet computer also uses cache memory. Describe the purpose of cache memory. .... [2]
Q3	A microwave oven is controlled by a small, specially built CPU. The table below shows some CPU instructions and what they mean. <table><tr><th>CPU instruction</th><th>Meaning</th></tr><tr><td>00001000 00010100</td><td>Add 20 to the timer</td></tr><tr><td>00001000 00000001</td><td>Add 1 to the timer</td></tr><tr><td>00000100 00000001</td><td>Subtract 1 from the timer</td></tr></table> (a) Using examples from the instructions above, state what is meant by: (i) an opcode .... [2] (ii) an operand .... [2]

Q4	The time displayed on the microwave oven is represented as two 8-bit binary numbers, one for the minutes and one for the seconds.
	
	For example;
	    "8:20" is stored as 00001000 00010100
	    "15:45" is stored as 00001111 00101101
	
	(b) Show how the time 5:30 will be stored.
	
	....
	
	.... [2]

Q5	00001000 00010100 can represent either the instruction for "Add 20 to the timer" or the data for the time "8:20". Explain how the CPU can determine whether it represents an instruction or data. .... [1]

Q6	A bank uses a local area network to connect all the computers in its head office.
	
	(a) State **two** ways the local area network can be used to monitor the work of employees.
	
	    1 ....
	
	    ....
	
	    2 ....
	
	    ....
	
	    [2]

6-A-Day – Computer Science GCSE (45)

Q1	A bank uses a local area network to connect all the computers in its head office. Computers in the network can be identified using both IP addresses and MAC addresses. Describe **two** differences between IP addresses and MAC addresses. .... **[4]**
Q2	The bank network uses failover. Describe what is meant by failover and justify the need for failover in the network. .... **[4]**
Q3	The character é is part of a computer's character set. **(a)** Describe what is meant by a character set. .... **[1]**

Q4	When sending text messages using a mobile phone, people can choose from hundreds of characters, called emoji, to insert in their message. An example of an emoji is 🙊. The Unicode character code for the emoji 🙊 in hexadecimal is 1F64A. **(b) (i)** Convert the hexadecimal number 1F64A to binary. The first three hexadecimal digits have been done for you.

Hexadecimal:	1	F	6	4	A
Binary:	0001	1111	0110	....	....

[2]

Q5	Explain why mobile phones that can send emoji would use Unicode instead of ASCII as their character set. .... **[2]**

Q6	*Produce a bullet point plan for your essay answer*	Lauren is a Computing teacher. She is building a website for her Computing class where they can share ideas, send each other programs and discuss computing concepts. The students will have individual accounts that they can log into. Discuss the ethical and legal issues Lauren will have to consider when setting up the website. The quality of your written communication will be assessed in your answer. .... **[6]**

6-A-Day – Computer Science GCSE (46)

| Q1 | Charlotte runs a website which stores details about movies. The users can log onto the website and leave ratings for movies.

The websites uses a database with three tables:

- The table FILM contains the following fields; FilmID, Title, Year, Director, Category
- The table USER contains the following fields; UserID, FirstName, Surname, DateOfBirth
- The table RATING stores, amongst other fields, the rating a user has given a film (a score out of 5).

An extract of the data in the table RATING is shown in Fig. 1: |
|---|---|

RatingID	FilmID	UserID	Rating
00214	16CM12	20_Elliot	4.5
00215	55HR8	Jade01	1
00216	12HR15	Sunil_99	1
00217	16SF8	Jade01	2

Fig. 1

(a) Explain why FilmID has been included in the RATING table.

....

....

....

....

....

.... **[3]**

| Q2 | (b) Explain why it is a good idea to separate the data from the applications that use the database.

....

....

....

.... **[2]** |
|---|---|

| Q3 | (c) Give **one** example of a record that could be stored in the user table.

....

.... **[1]** |
|---|---|

Q4	
	(d) (i) Charlotte uses a query to list films. The query uses the following criteria: (Rating < 2) AND (UserID = "Jade01") List the RatingID(s) of the rating(s) that will be selected from the extract shown. .... **[1]** **(ii)** Write the criteria for a query that will select all Films produced in the Year 2015 in the Category "Comedy". .... **[3]**

Q5	Joseph is an author and programmer, and he needs to estimate how many pages his new book will have.
	
	Each page has an average of 300 words. Each chapter starts with a chapter title page.
	The number of pages is estimated by;
	    • dividing the number of words by 300
	    • ignoring the decimal part of the division
	    • adding the number of chapters to this total.
	
	Joseph uses the algorithm below to estimate the number of pages, but his algorithm does not give the correct result.
	
	<pre>01 INPUT numberOfWords
	02 INPUT numberOfChapters
	03 CONST wordsPerPage = 300
	04 numberOfPages = RoundDown(numberOfWords / wordsPerPage)
	05 numberOfPages = numberOfWords + numberOfChapters
	06 OUTPUT numberOfPages</pre>
	Joseph has used a RoundDown function to remove the decimal part of the division, e.g. RoundDown(6.2) would return 6, RoundDown(7.8) would return 7.
	
	(a) State whether this algorithm uses selection, sequence or iteration.
	
	.... **[1]**

Q6	Line 03 defines a constant. Describe what is meant by a constant. .... **[2]**

6-A-Day – Computer Science GCSE (47)

| Q1 | Joseph is an author and programmer, and he needs to estimate how many pages his new book will have.

Each page has an average of 300 words. Each chapter starts with a chapter title page. The number of pages is estimated by;
- dividing the number of words by 300
- ignoring the decimal part of the division
- adding the number of chapters to this total.

Joseph uses the algorithm below to estimate the number of pages, but his algorithm does not give the correct result.

```
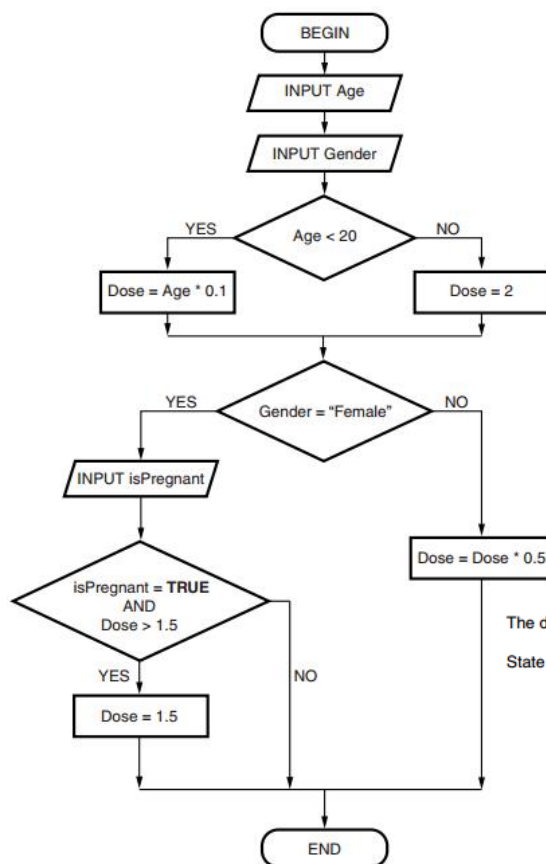01  INPUT numberOfWords
02  INPUT numberOfChapters
03  CONST wordsPerPage = 300
04  numberOfPages = RoundDown(numberOfWords / wordsPerPage)
05  numberOfPages = numberOfWords + numberOfChapters
06  OUTPUT numberOfPages
```

Joseph has used a `RoundDown` function to remove the decimal part of the division, e.g. `RoundDown(6.2)` would return 6, `RoundDown(7.8)` would return 7.

There is an error in line `05` of the algorithm.

Write a corrected line of code to replace line `05`.

.... **[1]** |

| Q2 | Identify the most appropriate data type for the following variable `numberOfWords`. Give a reason for your choice.

Data type ....

Reason ....
[2] |

| Q3 | Joseph is changing his algorithm and needs to store the name and price of his book in new variables. State the most appropriate data type(s) for these variables.

Name ....

Price ....
[2] |

Q4	Joseph is using an Integrated Development Environment (IDE) to produce the program.
	(f) One tool in an IDE that Joseph uses is a translator.
	Describe **two** additional tools in an IDE that Joseph could use to help him produce his program.
	Tool 1 name: ....
	Tool 1 description: ....
	....
	Tool 2 name: ....
	Tool 2 description: ....
	....
	[4]
Q5	Joseph's IDE allows him to use both a compiler and an interpreter.
	Describe how Joseph could make use of a compiler and an interpreter when producing his program.
	Compiler: ....
	....
	....
	....
	Interpreter: ....
	....
	....
	....
	[4]
Q6	
	Explain how reducing the number of colours in an image can reduce its file size.
	....
	....
	....
	.... **[2]**

6-A-Day – Computer Science GCSE (48)

Q1

5 Alex is producing images and sound effects for a website.
Part of a bitmap image is shown in Fig. 2:

W	W	R	R	R	B	B
W	W	R	Y	R	B	B
B	B	R	R	R	B	B
B	B	B	LG	B	DG	B
B	DG	DG	LG	DG	B	B
B	B	DG	LG	B	B	B
B	B	B	LG	B	B	B

Fig. 2

The letters represent a colour, as shown in Fig. 3:

Letter	Colour
W	White
B	Blue
R	Red
Y	Yellow
DG	Dark Green
LG	Light Green

Fig. 3

Using the example in Fig. 2, explain how a bitmap image is stored on a computer.

....

....

....

....

....

.... **[3]**

Q2

The final image file may contain metadata. Describe, using an example, what is meant by metadata.

....

....

....

.... **[2]**

Q3

Alex needs to create an audio recording of himself playing his guitar.

(i) Explain how sampling is used to make the recording.

....

....

....

....

....

.... **[3]**

Q4

State the effects of increasing the sample rate of the recording.

....

....

....

.... **[2]**

Q5

Quinn's current computer specification is shown in Fig. 4.

```
1.5 GHz Dual Core Processor
1GB RAM
100GB Hard Drive
64KB Cache
Touchscreen
Integrated camera and speakers
2 × USB 3.0 ports
2 × USB 2.0 ports
Blu-ray drive
2GB Graphics Card
```

Fig. 4

(a) Describe the benefits of a dual core processor over a single core processor.

....

....

....

.... **[2]**

Q6

Quinn is considering upgrading the RAM.

(i) Describe **two** differences between RAM and ROM.

Difference 1 ....

....

....

Difference 2 ....

....

....

[4]

6-A-Day – Computer Science GCSE (49)

Q1	Quinn's current computer specification is shown in Fig. 4. 1.5 GHz Dual Core Processor 1GB RAM 100GB Hard Drive 64KB Cache Touchscreen Integrated camera and speakers 2 × USB 3.0 ports 2 × USB 2.0 ports Blu-ray drive 2GB Graphics Card **Fig. 4** **(ii)** Quinn has decided to upgrade the RAM on his computer. Explain why this would improve the computer's performance. .... **[2]**
Q2 *Produce a bullet point plan for your essay answer*	After upgrading the RAM, Quinn could make further changes to improve his computer's performance. Identify the changes and explain how these changes would improve performance. The quality of your written communication will be assessed in your answer. ....

Q3	A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).
	(a) Identify **two** differences between a WAN and a LAN (Local Area Network).
	Difference 1: ....
	....
	Difference 2: ....
	....
	....
	[2]
Q4	OCR Supermarkets use a client-server network to connect the checkout computers to the store's server.
	Describe **two** benefits to OCR Supermarkets of using a client-server network instead of a peer-to-peer network.
	Benefit 1: ....
	....
	....
	Benefit 2: ....
	....
	....
	[4]
Q5	The supermarket manager's computer can access the Internet and the World Wide Web.
	(c) Explain the difference between the Internet and the World Wide Web.
	....
	....
	....
	.... **[2]**
Q6	Convert the decimal number 191 into 8-bit binary.
	.... **[1]**

6-A-Day – Computer Science GCSE (50)

Q1	Perform the following binary addition
	$+\begin{array}{r} 01101011 \\ 01011011 \end{array}$
	[2]

Q2	A memory game is played where:
	• three players (A, B and C) have to choose a number between 0 and 100
	• if the number has already been chosen, a message is displayed that says `"taken"`
	• if the number has not already been chosen, the player's letter is placed next to it
	• the quantity of numbers that have not yet been chosen is displayed.

The winner is the player who has chosen the most unique numbers by the end of the game.

The numbers are stored in an array; `numbers ()`. A number that has not yet been chosen is stored as an empty string `""`. The players are represented by `"A"`, `"B"` and `"C"`.

Fig. 5 shows an extract from the array:

Number:	0	1	2	3	4	. . .	. . .	99	100
Player:	A	C	B		A			B	

Fig. 5

You have been asked to program part of the game.

Write an algorithm for player A's turn, which;
- takes as an input the number that player A chooses
- if it has not already been chosen, stores an `"A"` in that array element
- if it has already been chosen, outputs `"taken"`
- counts and outputs the quantity of numbers left that have not been chosen.   [6]

Q3	Ann wants to purchase a new computer and is looking at two models. The specification of the CPU in each computer is shown in **Fig. 1**.

Fig. 1

Computer 1	Computer 2
Clock Speed: 1 GHz	Clock Speed: 1.4 GHz
Cache size: 2 MB	Cache size: 2 MB
Number of Cores: 4	Number of Cores: 2

(a) When running a 3D flight simulator, Computer 1 is likely to run faster than Computer 2.

Using the information in **Fig. 1**, identify **one** reason for this.

....

....

[1]

Q4

(b) Identify **two** internal components that are not in **Fig. 1**, which could improve the performance of the computers.

....

....

[2]

Q5

(c) Explain **one** reason why the cache size affects the performance of the CPU.

....

....

[2]

Q6

(d) Identify **four** events that take place during the fetch-execute cycle.

....

....

....

....

[4]