

N5 Computing Science - Solutions

Revision 1

1. Convert the following decimal numbers to binary using the table below.

	128	64	32	16	8	4	2	1
22	0	0	0	1	0	1	1	0
144	1	0	0	1	0	0	0	0
73	0	1	0	0	1	0	0	1

2. How does a computer represent characters in a computer system?

ASCII or Unicode

3. Calculate the backing storage required for a 16-bit colour image 1600 pixels by 900 pixels. Give your answer in megabytes. Show your working below.

2.7 Mb

4. Explain the difference between a compiler and an interpreter.

Compiler translates high level language into machine code all at once. Interpreter does this one line at a time.

```
Line 1 RECEIVE age FROM (INT) KEYBOARD
Line 2 WHILE age < 18 OR age > 65 DO
Line 3     SEND "Error: Re-enter age 18-65" TO DISPLAY
Line 4     RECEIVE age FROM (INT) KEYBOARD
Line 5 END WHILE
```

Read the code above.

5. What kind of loop is used in the above program?

Conditional loop

6. What standard algorithm is this?

Input validation

7. What data type is the variable age?

Integer

8. Describe what happens when a user enters their age as 10?

The user will get an error message and be asked to re-enter their age. This will continue to repeat until the age is between 18 and 65.

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Revision 2

1. Describe what the code below does.

SET age TO 15
Assigns the value 15 to the variable age
SET name TO "Samantha"
Assigns the value Samantha to the variable name
SET total TO salary - tax
Assigns the value of salary -tax to the variable total

2. Jack has created a program to record his test results. His tests are out of 10. The maximum mark Jack could achieve is 10 and the lowest is 0. Jack will test his program using normal, extreme and exceptional test data. State appropriate test data below.

Normal	2-9
Extreme	0 or 10
Exceptional	<0 or >10

3. Jack's program has come up with an error saying a variable name is not defined. This probably means the variable name has been spelt wrong. What type of error is this?

Syntax error

4. What is the difference between a fixed loop and a conditional loop?

A fixed loop is set to repeat a set amount of times by the programmer in advance. A conditional loop will keep repeating until a condition is met.

5. What is the difference between a simple condition and a complex condition?

A simple condition is when there is only one condition to be met. A complex condition will involve 2 or more conditions to be met.

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Revision 3

1. Describe one advantage of using linked tables.

Avoids data duplication

2. When ordering clothes online, users select their choice the following drop down menu:



This is a restricted choice. State one advantage of this type of interface.

Avoids human error or quicker as they can select an option very quickly.

3. Describe what a database is.

A database is an organised collection of information. This information can be sorted and searched easily.

4. State the three parts the processor is made up from.

ALU, Control Unit and Registers

5. What job does the ALU perform?

To deal with comparisons. To carry out the calculations.

6. When signing up to Facebook you **must** enter an email address. What type of validation should be used on this field?

Presence check

7. What type of validation is used when a cost has to be between £100 and £200?

Range check \geq £100 and \leq £200

8. What type of validation is used when a password has to be greater than or equal to 8 characters long?

Length check \geq 8

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Revision 4

1. A computer program is created to store data about the total number of pupils who pass an exam. State the most suitable data type for the total.

Integer

2. State what data type would be used if the only two possible values could be true or false?

...

Line 4 SET password TO "h1gh@sch001"

Line 5 REPEAT

Line 6 SEND "Please enter your password" TO DISPLAY

Line 7 RECEIVE user_guess FROM (STRING) KEYBOARD

Line 8 UNTIL password = user_guess

3. Read the code above and explain the purpose of lines 5 to 8 in this pseudocode.

To make sure the password that is entered is correct before proceeding.

4. State what URL stands for.

Uniform resource locator

5. A URL is split up into three parts. State the names of the three parts.

Protocol, Server, Organisation

6. Describe the difference between an internal link and an external link.

An internal link will take you to a page on the same website. An external link will take you to a different website with a different domain.

7. Web browsers such as Google Chrome and Internet Explorer are used to view web pages. State one other feature of a web browser.

Bookmarks/favourites, history, forward/back buttons, home button, extensions/plugins

8. Explain the three main steps of how a search engine, such as Google or Bing, works.

- **The user enters keywords or phrases on the subject that they are interested in.**
- **The search engine searches its database looking for references to the key words.**
- **It then returns web pages with links to the relevant websites it found.**

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Revision 5

A program is written to calculate the cost of feeding chickens for one month. Chickens eat 5 Kilograms of grain each month. An incomplete design for the program is shown below.

Line 1	SEND "Enter the number of chickens and the cost of grain" TO DISPLAY
Line 2	RECEIVE numberOfChickens FROM (_____) KEYBOARD
Line 3	RECEIVE pricePerKilo FROM (_____) KEYBOARD
Line 4	SEND "Is the grain full price?" TO DISPLAY
Line 5	RECEIVE fullPrice FROM (_____) KEYBOARD
Line 6	IF fullPrice = True THEN
Line 7	SET totalPrice TO numberOfChickens *5*pricePerKilo
Line 8	END IF
Line 9	IF fullPrice = False THEN
Line 10	SET totalPrice TO numberOfChickens *5*(pricePerKilo*0.8)
Line 11	END IF
Line 12	SEND ["The total cost of grain required for" & numberOfChickens & "chickens is £" & totalPrice] TO DISPLAY

1. The above design should show the type of data being entered by keyboard in Lines 2, 3 and 5. State the most appropriate data types for the following variables.

numberOfChickens	Integer
pricePerKilo	Real number
fullPrice	Boolean

2. State the lines of pseudocode that contain conditional statements (if statements).

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Line 6 and Line 9

3. State the part of the processor that compares the values in the conditional statements and carries out the logical thinking.

ALU

4. The program is later improved to store the totalPrice for each month of a year.

State the data structure that would be required to store the **list** of totalPrice values.

Array

5. State the **type** of loop required to repeat the code in lines 1 to 12 for each month of the year. Explain why this type of loop would be used.

Type of Loop	Fixed loop
Explanation	We know in advance it will repeat each month. There are 12 months in a year so can set it to repeat that amount.

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Revision 6

1. What does HTML stand for?

Hyper Text Markup Language

2. What is HTML used for?

Its used to deisgn the structure of web pages.

3. What is JavaScript used for?

JavaScript is used to add interactivity to a website.

4. Explain the difference between an expert user and a novice user.

An expert user will use the software/info system to its full potential. They will utilise all its features. A novice user will stick to the basics and will not want information overload. Novice users may use wizards to help them to certain tasks.

5. A novice user may use a wizard to perform a complex operation. Describe what a wizard is.

A wizard is used to guide a user step by step through a complex operation.

6. Calculate the backing storage required for a 8-bit colour image 600 pixels by 800 pixels. Give your answer in Kilobytes and show your working below.

468.8 Kb

7. Convert the following decimal numbers to binary using the table below.

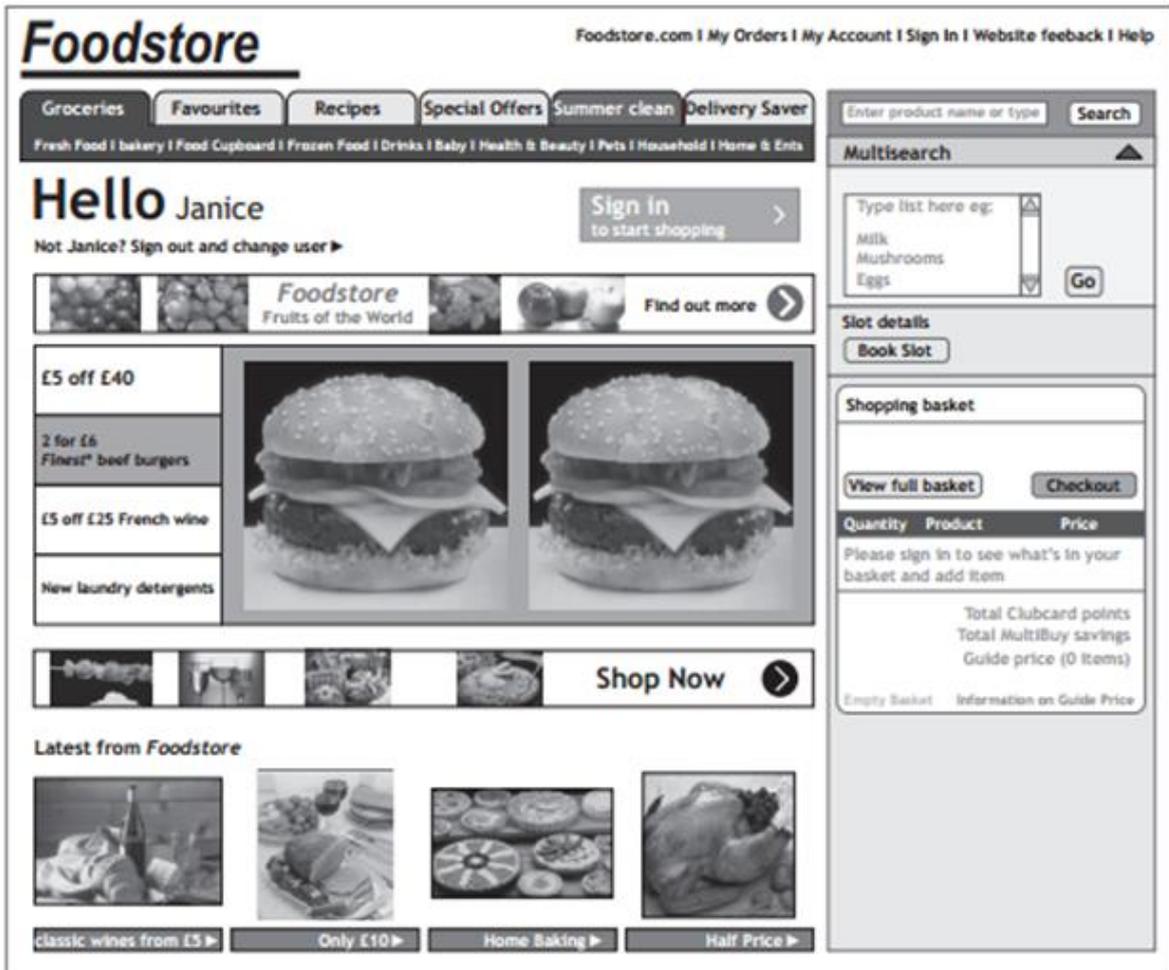
	128	64	32	16	8	4	2	1
45	0	0	1	0	1	1	0	1
77	0	1	0	0	1	0	1	1
234	1	1	1	0	1	0	1	0

7. Convert the following binary numbers to decimal using the table below.

	128	64	32	16	8	4	2	1
58	0	0	1	1	1	0	1	0
158	1	0	0	1	1	1	1	1
229	1	1	1	0	0	1	0	1

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Revision 7



1. The company has received complaints from some customers that the website is difficult to use on their tablet or smartphone.

Identify two reasons why the webpage above would be unsuitable for such portable devices.

Reason 1	<ul style="list-style-type: none">● Navigation bar does not fit across small screen● Too many columns Too much information for small screen
Reason 2	<ul style="list-style-type: none">● Icons too small to click on right hand side● Would take too long to load images on portable device

2. State two standard file formats for text.

TXT and RTF

3. State two standard file formats for audio.

WAV and MP3

4. State two standard file formats for video.

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MP4 and AVI

5. Describe what a standard file format is.

A standard file format is when a file is saved in a format that can be opened by many different applications and they are able to understand it.

6. State two input devices and two output devices below.

Input Devices	Output Devices
Mouse Keyboard Touchpad Touch screen Scanner Digital camera / webcam	Printer Monitor Projector Speakers

7. State what ROM stands for.

Read Only Memory

8. State what RAM stands for.

Random Access Memory

9. Describe two differences between RAM and ROM.

RAM	ROM
<ul style="list-style-type: none">• Data held in RAM can be changed• All data in RAM is lost when the power is switched off	<ul style="list-style-type: none">• Data is stored permanently in ROM,• Data is not lost when the power goes off• Data in ROM cannot be changed

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Revision 8

1. State the units of storage in order starting from Bit up to Terabyte below.

Bit
Byte
Kilobyte
Megabyte
Gigabyte
Terabyte

2. State one advantage of using a 8GB USB Pen Drive to store photographs on.

USB pen drives are light and portable. They can be re-written to and 8GB is enough to store many photos.

3. Describe the difference between a DVD-R and DVD-RW.

DVD-R can only be written to once with data. DVD-RW can be rewritten to.

4.State what LAN stands for.

Local Area Network

5. State what WAN stands for.

Wide Area Network

6. State one advantage and one disadvantage of using local storage.

Advantages	Disadvantages
<ul style="list-style-type: none">• You have 100% control over the data.• Very affordable, especially for large amounts of data. External hard drives come quite cheap these days.• No internet connection required.	<ul style="list-style-type: none">• Just like your primary hard drive, external media can fail as well.• Possible theft• No data access on-the-go unless you bring the media with you which might be too bulky.

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7. State one advantage and one disadvantage of using cloud storage.

Advantages	Disadvantages
<ul style="list-style-type: none">• Some services offer a basic free version, such as Dropbox (2 GB) and OneDrive (25 GB)• Available anywhere there's an internet connection without having to carry anything extra• Third parties handle taking care of the hardware so no worries about storing external media in a safe place	<ul style="list-style-type: none">• Internet connection required.• Depending on a third party that you have no control over.• The third party might randomly shut down due to financial hardships or other unforeseen circumstances.• Often can be more expensive if you need to store large amounts of data.

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Revision 9

1. Describe what a keylogger does.

They monitor and store a record of every keystroke made on the computer. This data may then be sent to a remote server without your knowledge.

2. Describe what phishing is.

Phishing is a form of online fraud where criminals aim to steal valuable information such as credit cards, user IDs and passwords for bank accounts. They set up a fake website which looks identical to a legitimate company such as a bank or insurance company. They then try to trick people into logging into the site and giving their account details and security codes.

3. Describe what identity theft is.

Identity theft is where criminals obtain personal information such as your date of birth, bank account numbers, your mother's maiden name, your pet's name and so on. They then use this information to impersonate you.

4. Describe what a DOS attack is.

A Denial of Service attack is when the server is overwhelmed by millions of rogue requests being sent to it, effectively using up all its resources and denying normal service for legitimate users.

5. Describe what would make a password more secure.

Contain a mixture of letters, numbers and symbols.

6. Describe why encryption makes communication more secure.

Encryption means to scramble a message in such a way that only the people who are meant to read it can do so.

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Revision 10

1. If I logged into another person's account in school, what law am I breaking?

Computer Misuse Act

2. If I installed a virus on another person's computer, what law am I breaking?

Computer Misuse Act

3. State the name of the law that is used to give legal rights to people who have information stored about them?

Data Protection Act

4. State the name of the law that covers illegal downloading of music and videos if you do not have the permission to do so.

Copyright Designs & Patents Act

5. Copying and pasting an image from a website without the owner's permission would be breaking what law?

Copyright Designs & Patents Act

6. State the name of the law you would be breaking if you are using your neighbours WiFi without their permission.

Communications Act

7. People can suffer a repetitive strain injury (RSI) from working on computer for a long period of time. Suggest one way the risk of this happening can be reduced.

The risk can be reduced by taking regular breaks, using an ergonomic keyboard and using wrist rests.