

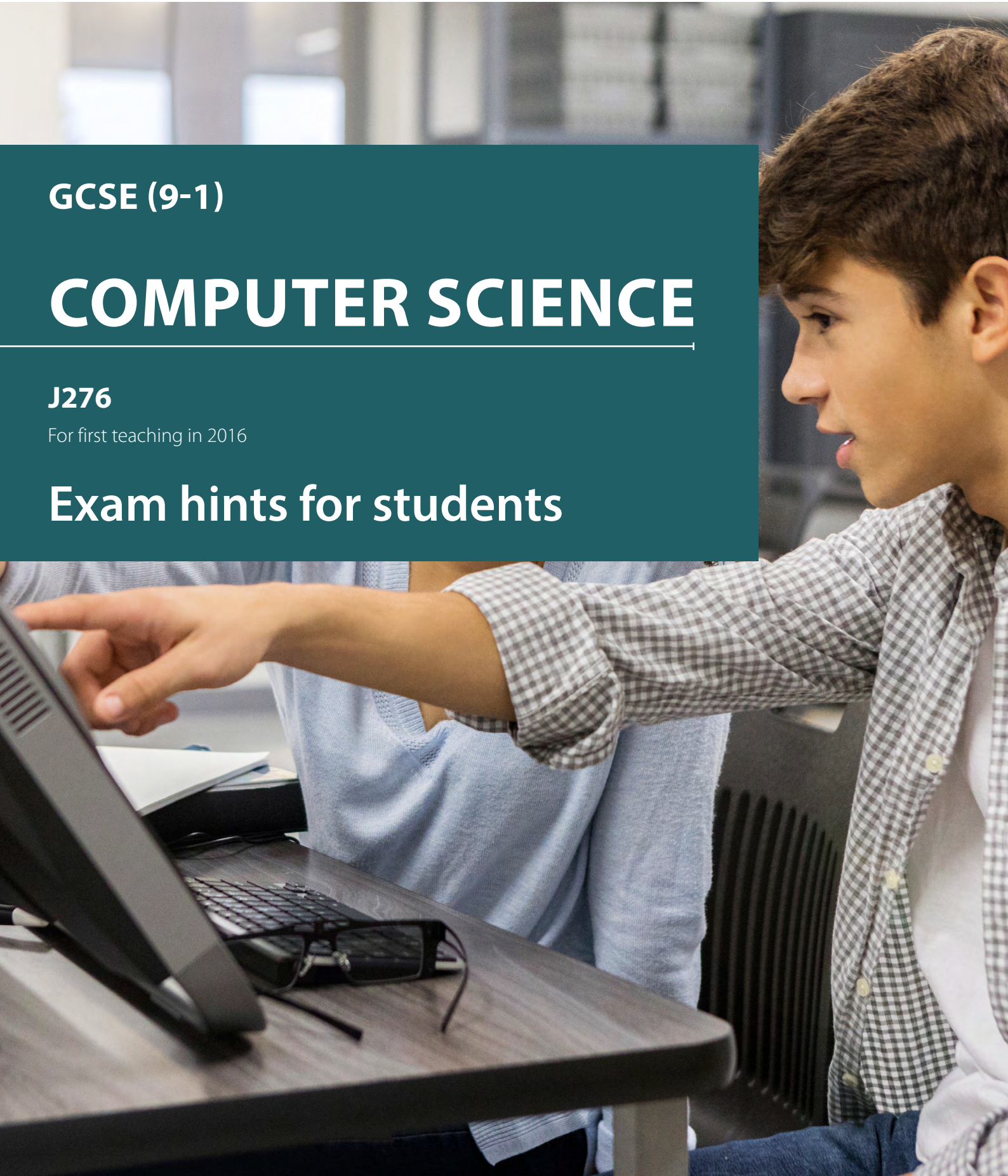
**GCSE (9-1)**

# COMPUTER SCIENCE

**J276**

For first teaching in 2016

## Exam hints for students



# GCSE (9–1) COMPUTER SCIENCE J276

## General tips

### Try to write clearly



- If an examiner cannot read what you have written you may not get credit.

### Give balanced answers

(iii)\* Kerry was originally going to use an optical storage device to transfer her files.

Discuss whether an optical or solid state device is the most appropriate media to transfer these files.

You may want to consider the following characteristics in your answer:

- portability
- robustness
- capacity
- cost

Both optical storage and solid state devices are quite portable, as they are quite small and light. Solid state is robust as it has no moving parts and optical is robust as well, although it can get scratched easily. Solid state, on average has a large capacity, although this comes at a higher price as solid state is one of the most expensive secondary storage options. Optical storage however, has a small capacity, but is very cheap so you could easily buy a lot of them to get more capacity. However you also need a visual player to see your files if you store them on an optical disk whereas a solid state drive works anything.

- Some questions will need you to give a balanced argument. Make sure you have points both for and against.

### Underline key points

- 3 Hamish stores confidential documents on his laptop.
- (a) Hamish needs his computer to be secure from unauthorised access when connected to a network.
- (i) Describe the problems that can arise from unauthorised access to his laptop and confidential documents.

- Highlight or underline key words and phrases in the question. Check you have included/linked to these in your final answer.

### Use technical terms

- 5 The IP address 192.149.119.226 is linked to the website with a URL of <https://www.ocr.org.uk>
- (a) When <https://www.ocr.org.uk> is entered into a browser, the website homepage is loaded.

Describe the relationship between the website URL (<https://www.ocr.org.uk>), the IP address and the webserver.

The website URL contains the domain name e.g. "ocr" and the protocol "https". Domain Name server is used to get the name domain name of the URL and link it to the IP address and webserver. The

- Use technical words accurately.

### Crossing out mistakes

2 ~~Disk~~ def stores his files in the correct way

- Use a single line to cross out mistakes. Make sure your new answer is clear to the examiner.

### Be clear when making comparisons

- Using words like 'bigger', 'faster', 'better' need to have a comparison. For instance, "A is faster than B because..."

## Only give the number of points asked for

- If you give 4 point where only two are needed, only the first 2 will be accepted.

## If you need more space – use the Additional Answer Space

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### ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

4b(i) Alternatively on his phone he may notice his network signal degrades the further he is from the WAP as the waves from the access point disperses fairly quickly over short distance.

- Do not try and squeeze answers into answer spaces. This may make it harder to read.

**Pg 19 additional answer space used well.**

## Plan your answers

- It is worth making short notes before starting long answer questions.
- Tick off each point you make as you to. This makes sure you include all your ideas!

# GCSE (9–1) COMPUTER SCIENCE J276

## Component 01

### Key misconceptions and advice

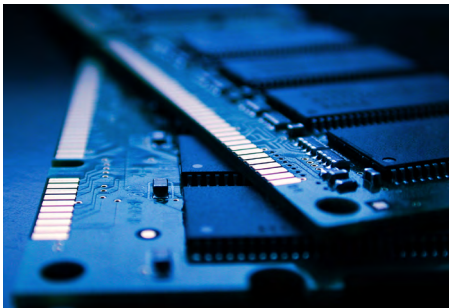
#### 1.1: Systems Architecture

- When comparing CPU speeds, you need to think about clock speed, cache size and number of cores. Just because one is larger/faster does not mean it is faster.
- Embedded systems are usually pre-programmed and stored in ROM.

#### 1.5: Network topology and layers

- Remember to be clear about the differences between POP, IMAP and SMTP protocols. They are all to do with sending mail – but are slightly different.
- You do not need to know what each network layer is called. Just why layers are useful in networks, and why we use them.

#### 1.2: Memory



- Virtual memory refers to space on a secondary storage device to store temporary data (e.g. to cope when RAM is full)

#### 1.6: System Security



- Encryption does not stop data theft. Encryption protects the data from being read as easily.

#### 1.3: Storage

- Avoid general statements like "Flash memory is better". Most questions will ask you compare different storage devices and why one is better or worse than another.
- Remember that the **scenario** in storage questions will affect how you compare storage devices

#### 1.7: Systems Software

- Be clear between utility software and operating systems. Operating systems often come with utility software included. This does not mean that they are the same thing.

#### 1.4: Wired and Wireless networks



- Virtual networks are created by software and wireless technology.

#### 1.8: Ethical, legal, cultural and environmental issues



- These questions will often be where the quality of written communication will be assessed
- You will often be asked to write a balanced argument here
- Remember questions may ask you for good and bad points
- It is always worth spending 5 minutes to plan your answer. This will help you write in a sensible order, and to mention everything you want to.

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## Component 02

### Key misconceptions and advice

#### 2.1: Algorithms



- Recognise the key words and pseudocode for each algorithm
- You may find our [Algorithms booklet](#) useful for ideas.
- Get your classmates to make small errors in an algorithm and practise spotting them

#### 2.2: Programming Techniques

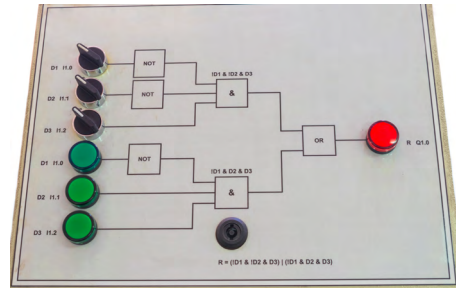


- The best way to revise these is by programming
- Practice coding small algorithms to help you understand how each programming technique
- Make sure loops have a START and END condition
- Check your > and < signs are the correct way around in loops and IF statements
- Many questions in the exam allow you to write your algorithms in short statements or bullet points – you may find this easier

#### 2.3: Producing Robust Programs

- Defensive design is about thinking how a program may be misused and how to stop this
- Good test plans will test:
  - That a program works when sensible data is used
  - How a program works when silly/wrong data is used
  - That the correct results are given when normal data is used
- Some errors **stop** the program from compiling, like syntax errors
- Some errors may only be detected when the program is **running**: Logic errors, divide by zero

#### 2.4: Computational Logic

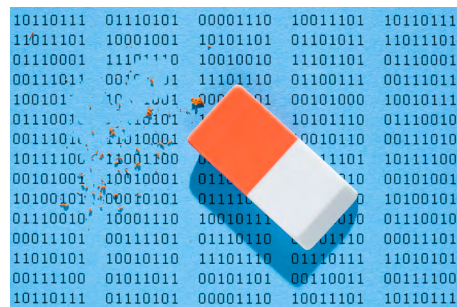


- Data is represented in binary due to the 'ON' 'OFF' nature of electricity! These link to pulses of electricity used in computers.
- Be sure you remember the difference between MOD and DIV.

#### 2.5: Translators and facilities of languages

- High-level languages look more like English. They are 'further away' from what a computer can understand.
- Be clear between an assembler, compiler and interpreter. For example, a compiler produces a completed program file. An Interpreter reads the code 'live'. Each one has its use.

#### 2.6: Data Representation



- Binary numbers do not always have 8-digits! 11010 is the **same number** as 0001 1010
- Align your numbers to the **RIGHT** when adding binary numbers of different 'lengths':
$$\begin{array}{r} 1100\ 0011 + \text{NOT } 1100\ 0011 + \\ 1\ 1001 \qquad \qquad 1100\ 1 \end{array}$$
- You **can** use either 1024 or 1000 in your calculations – both will be accepted
- Compression does not allow you to send data "faster". That depends on your internet connection! You can send more compressed data in the same amount of time as uncompressed data if transmitting at the same speed.
- Lossy Compression means some data is deleted(lost) when compressed.

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