GCSE (9-1)

Exemplar Candidate Work

COMPUTER SCIENCE

J276
For first teaching in 2016

J276/01 Summer 2019 examination series

Version 1

Contents

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Introduction

These exemplar answers have been chosen from the summer 2019 examination series.

OCR is open to a wide variety of approaches and all answers are considered on their merits. These exemplars, therefore, should not be seen as the only way to answer questions but they do illustrate how the mark scheme has been applied.

Please always refer to the specification https://www. ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/ for full details of the assessment for this qualification. These exemplar answers should also be read in conjunction with the sample assessment materials and the June 2019 Examiners' report or Report to Centres available from Interchange https://interchange.ocr.org. uk/.

The question paper, mark scheme and any resource booklet(s) will be available on the OCR website from summer 2020. Until then, they are available on OCR Interchange (school exams officers will have a login for this and are able to set up teachers with specific logins – see the following link for further information http://www. ocr.org.uk/administration/support-and-tools/interchange/ managing-user-accounts/).

It is important to note that approaches to question setting and marking will remain consistent. At the same time OCR reviews all its qualifications annually and may make small adjustments to improve the performance of its assessments. We will let you know of any substantive changes.

Question 1(a)(i)

1   Kerry wants to buy a new computer, but she does not understand what the different parts of a computer do.

   (a) Kerry has heard of a CPU but does not know what it is.

      (i) The following sentences describe the purpose of a CPU.

      Complete the sentences by filling in the missing words.

      CPU stands for ....

      It is the part of the computer that fetches and executes the ....

      that are stored in ....

      The CPU contains the Arithmetic .... Unit (ALU) and

      the .... Unit (CU).

      [5]

Exemplar 1   5 marks

CPU stands for ......Central processing unit....... .

It is the part of the computer that fetches and executes the ...instructions...............

that are stored in .....Cache....... .

The CPU contains the Arithmetic ......Logic........................... Unit (ALU) and

the ....Control........... Unit (CU).

[5]

Examiner commentary

The candidate has given four accurate answers, and another BOD (Benefit of the doubt) mark is awarded for 'cache' because the processor can access instructions directly from cache instead of memory such as RAM. Total 5 marks given.

Question 1(a)(ii)

(ii) Kerry is looking at two computers; one has a single core processor and the other has a dual core processor.

Explain why having a dual core processor might improve the performance of the computer.

....

.... [2]

Exemplar 1   0 marks

A dual core processor will allow the computer to execute instructions faster as more instructions can be processed per second.

Examiner commentary

This candidate has stated that more cores allows the computer to execute instructions faster - which is not enough because each instruction is not executed faster. They repeat this with more instructions can be processed per second; increasing the clock speed also does this. The candidate has not demonstrated an understand of why the dual core improves the performance.

Exemplar 2   1 mark

Each processor will run independantly and therefore 2 fetch-decode-execute cycles can be carried out simultaneously. This improves the performance of the computer as more instructions are being carried out in a given time making it faster.

Examiner commentary

The candidate has identified that two cycles can be carried out simultaneously and has been awarded this mark. They then repeat the same point, more instructions are carried out in a given time.

Question 1(a)(iii)

(iii) One computer has 64 kilobytes of cache and the other has 512 kilobytes of cache.

Explain how the cache size can affect the performance of the CPU.

....

.... [2]

Exemplar 1   1 mark

Cache size affects the performance of the CPU as data is stored in the cache. If there is insufficient cache, the CPU will reduce in speed.

Performance [inserted]

[2]

Examiner commentary

The candidate has stated that data is stored in the cache, but not what kind of data. They have stated that if there is insufficient cache the CPU's performance will decrease which is awarded the benefit of doubt mark. Benefit of the doubt was given because enough cache does not actually improve the speed of the CPU, but does allow more instructions to be stored in cache, which has fast access speeds than RAM.

Exemplar 2   0 marks

The cache size affects the performance of the CPU because a higher amount of cache can hold more information. More cache will allow for more instructions to be stored, which will then be executed

[2]

Examiner commentary

This was a common incorrect answer as it was too vague to demonstrate understanding of how cache size affects the performance. They begin by saying it stores more information; which is not enough for frequently used data. They then say more cache allows more instructions to be stored - which is not related to the performance of the CPU.

Question 1(b)(i)

(b) Both computers have RAM and ROM.

(i) The table has **five** statements describing RAM and/or ROM.

Tick (✓) **one or more** boxes in each row to identify if that statement describes RAM and/or ROM.

	RAM	ROM
Stores data		
The memory is volatile		
Data will not be lost when the computer is turned off		
Data is read-only, cannot be changed		
Stores currently running data and instructions		

[5]

Exemplar 1   4 marks

	RAM	ROM
Stores data		✓
The memory is volatile	✓	
Data will not be lost when the computer is turned off		✓
Data is read-only, cannot be changed		✓
Stores currently running data and instructions	✓	

[5]

Examiner commentary

This was a common answer where the first statement should be both RAM and ROM. When the questions says 'one or more boxes' it indicates that at least one of the rows is likely to require two or more ticks (depending on the question)..

Question 1(b)(ii)

(ii) Give **one** difference between RAM and flash memory.

....

.... [1]

Exemplar 1
1 mark

The memory^(or data) stays permantaly with flash ~~at~~ but with RAM once the Computer is off [1] it goes

Examiner commentary

This was a common answer where the candidate described what was meant by 'non-volatile' i.e it's permanent.

Question 1(c)(i)

(c) Kerry has 5GB of files to transfer from her laptop at work to her new computer. She has been told to buy an external solid state device to do this.

(i) Give **one** example of a solid state device.

....

.... [1]

Exemplar 1
0 marks

CD

Examiner commentary

A common incorrect answer where candidates mixed up solid state device and optical device. A CD is an optical device whereas a flash drive is a solid state device.

Exemplar 2
1 mark

a ~~has~~ flash drive i-e memory pen.

Examiner commentary

Mark is given for the first correct answer 'flash drive'.

Question 1(c)(ii)

(ii)   Identify whether the device given in **part (c)(i)** is an example of primary or secondary memory.

....

.... **[1]**

Exemplar 1   1 mark

Secondary memory **[1]**

Examiner commentary

This question was often correct with candidates getting follow through if they incorrectly gave an example of primary memory in the previous response.

Question 1(c)(iii)

(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   **[8]**

Exemplar 1   2 marks

An optical device is more portable than a solid state drive as the optical device has no moving parts.

Solid state drive has more capacity than a optical device therefore it costs more.

Examiner commentary

This candidate gave a couple of valid points; solid has more capacity, costs more. Optical being more portable is not necessarily valid. This error and the lack of points and relating to the scenario kept the answer in the lowest band.

Exemplar 2

4 marks

(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

optical - cd's - + Portable
_____ durability
Solid State - sd, usb

[8]

• With optical it's very cheap to buy

• However with the low durability of optical

If Kerry chose optical, It's very portable and Cheap to by however it's got a low capability and It has low durability

Solid State such as an SD usb card are not as cheap as optical but It is still Portable

I believe that Kerry should Pick Solid state as it's more Convient to move with and even though It could get lost It won't be damaged easily.

Examiner commentary

This candidate has given several valid points; optical is portable, cheap. Low capability does not make sense in this context, but low durability is ok. Solid state being more expensive and portable. They have attempted to apply it to the scenario in the final paragraph, but this is very brief. The lack of expansions and application limited this response to the middle band.

Exemplar 3

8 marks

(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

*x both don't suffer from major damage if dropped, for example.

[8]

Optical devices have a low cost per unit of capacity generally, but compared to a solid state drive (which is often expensive), optical drives are very cheap. However, optical devices aren't as robust, because they have pits on the surface of the disk which represents a binary value. If the disk is scratched, a new pit is formed, changing the data which had been stored on the drive. Solid state drives are more robust, as they aren't easily damaged in that sense. Regarding portability, both devices are similarly easy to transport, as they have no moving parts on the drives themselves, and optical drives are also waterproof. Solid state drives generally come in larger capacities, as optical drives are usually used just for the storing of a multimedia project (e.g. a film). In terms of reading and writing speeds, solid state drives are faster, as the data on them can be randomly accessed, whereas in an optical drive, the laser light used to interpret the optical drive has to search for the data.

Overall, a solid state drive would be more practical for Kerry, as they generally come in larger capacities, which is appropriate as she is transferring all the data from her laptop, which would generally be a large amount of data. SSDs are also much faster to write to, which is beneficial as writing all her data to an optical drive would be time consuming. Despite SSDs having a shorter lifespan,

it will be more practical and easy to use, for the time
that it does operate. The robustness and portability are
also added benefits.

Examiner commentary

This candidate has given a well-structured response that has a discussion of both types of media, with multiple points for both sides. The final paragraph has good examples of linking the points back to the scenario, these are clear explicit links which allow it to access L3. The numerous valid points and structured discussion allow it to gain the maximum marks.

Question 1(c)(iv)

(iv)   The filesizes of Kerry's files are usually displayed in megabytes (MB) or gigabytes (GB).

Calculate how many MB are in 5GB. Show your working.

....MB **[2]**

Exemplar 1   2 marks

5 × 1000 = 5000

5000 ....MB **[2]**

Examiner commentary

This candidate has clearly shown their working and multiplication by 1000 or 1024 is permitted there the final answer is correct.

Exemplar 2   2 marks

5
×24
———
20
100
———
120

5 × 1000 = 5000
   + 120
   ———
    5120

5 × 1024 =

5120 ....MB **[2]**

Examiner commentary

This candidate has multiplied by 1024 which is acceptable, they have shown their working and clearly shown their answer.

Question 2 (a)

2   Xander's tablet computer comes with system software, including an operating system and utility system software.

(a)   The operating system provides file management.

Identify **three** ways that Xander can make use of the file management facility.

1   ....

....

2   ....

....

3   ....

....

[3]

Exemplar 1   2 marks

1   ~~Manage~~ Organise files So they can be easily found and accessed.

2   Xander will be able to identify large files which take up a lot of storage.

3   Can minimise storage by deleting these large files

[3]

Examiner commentary

The first response 'organise' is too vague; this could refer to putting them in directories or putting them into an order - the candidate has not explained what they mean by 'organise'.

The second point is given a mark for being able to see the file size. and the third is given a mark for deleting files. These responses are all put in context which was not required for the question but does not detract from the answers.

Exemplar 2　　　　　　　　　　　2 marks

1 Xander can change the location of files.

2 Xander can use the file management facility to delete ~~& modify files.~~

3 Xander can modify files' information.

[3]

Examiner commentary

The first point is given a mark for moving files; 'change the location of files'. The second point is given a mark for deleting files. The third is not given the mark because there is a lot of information in files, and about files, and it is not clear what is being modified here; if it is the content of the files then it is incorrect because that is done using application software.

Exemplar 3　　　　　　　　　　　1 mark

1 Order it so he know where his files are

2 Know what type of files they are

3 easy to find and open.

[3]

Examiner commentary

The first answer is not given the mark because it says 'order it' and it is not clear what 'it' refers to, 'it' must come from the questions and therefore be the 'file management facility' which is incorrect because it cannot be ordered.

The second one is given a benefit of doubt mark for being able to see the extensions or applications they were created with.

Easy to find and open is not a way that Xander can use the file management facility, it may be something the file management facility tasks help with but that is not what the question is asking for.

Question 2 (b) (i)

(b) The utility system software provides compression software. Xander uses this to compress an image.

(i) Explain how the compression software will compress the image file.

.... [4]

Exemplar 1   1 mark

The compression software, most likely lossy compression will reduce the size of the image file. By removing some elements of the image. This will reduce the image quality but can compress the file as much as it is needed.

[4]

Examiner commentary

The candidate has identified lossy compression and given 1 mark for this. They go on to say that it removes some 'elements', but this needs to be more exact, the candidates need to apply their knowledge to an image and say what elements of an image would be removed.

Exemplar 2   3 mark

The software will remove any colours which even don't affect the image. By deleting unneeded pixels the file size will decrease however the image won't look as good. This decreases the colour depth and is lossy compression. The software could also make the image smaller, to decrease the file size. This way the quality of the image isn't affected. This is called lossless compression

[4]

Examiner commentary

The candidate is given 1 mark for removing colours; this is applying compression to an image. They give a second example on line 2, saying that unneeded pixels are removed.

The first mark point awarded is repeated; decreases the colour depth and therefore not given a mark. At the end of this line they method a type of compression that can be used; lossy.

In the last paragraph they repeat the point about reducing file sizes by stating that the image is made smaller, they mention lossless compression but do not go on to say how lossless compression could be applied to an image.

Question 2 (b) (ii)

(ii) Give the name of **two** other types of utility system software.

1 ....

2 ....

                                                                                                                                                            [2]

Exemplar 1   2 marks

1 Drive De-Fragmentation ....

2 Anti virus ....

                                                                                                                                                            [2]

Examiner commentary

This candidate has given two of the most common correct responses; defragmentation and anti-virus.

Question 2 (c) (i) and (ii)

(c) Xander also has a smart watch.

(i) Tick (✓) **one** box to show whether the smart watch or the laptop is an example of an embedded system.

	Is an example of an embedded system
Smart watch	
Laptop	

[1]

(ii) Justify your choice to **part (i)**.

....

.... [2]

Exemplar 1   2 (c) (i) = 1, 2 (c) (ii) = 1, total = 2 marks

(c) Xander also has a smart watch.

(i) Tick (✓) **one** box to show whether the smart watch or the laptop is an example of an embedded system.

	Is an example of an embedded system
Smart watch	✓
Laptop	

[1]

(ii) Justify your choice to **part (i)**.

An embedded is a computer with a specific task in a larger device. A smart watch has the specific task to display the time mainly whereas on a laptop a user is open to do multiple tasks that massively differ from one another. e.g listen to music, play games, write. [2]

Examiner commentary

The candidate has correctly identified the smart watch as an embedded system. They have stated that the smart watch has a specific task which meets the MP for limited function(s), they then repeat this by saying the opposite for a laptop which is a REP.

Exemplar 2   2 (c) (i) = 1, 2 (c) (ii) = 2, total = 3 marks

(c) Xander also has a smart watch.

(i) Tick (✓) **one** box to show whether the smart watch or the laptop is an example of an embedded system.

	Is an example of an embedded system.
Smart watch	✓
Laptop	

[1]

(ii) Justify your choice to part (i).

An embedded system is a computer system inside
a larger device. A smart watch is a computer system
inside of a watch. A laptop is an example of a
general pup purpose system, not an embedded
system.

[2]

Examiner commentary

The candidate correctly identified that a smart watch was an example of an embedded system. In their explanation, they stated that a smart watch has a computer inside of it gaining one mark for applying the description of an embedded system to this scenario. They go on to give a reversed statement i.e. why a laptop is not a smart watch - because it is a general purpose system.

Question 3 (a) (i)

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.

....

.... [3]

Exemplar 1   2 marks

> Eg Hamish could lose all his confidential
> files to Hackers or they could destroy
> his files for fun and mess up his laptop
> or they could use it against khim
> to get some money out of him
> or send to the'Public.

....

....

.... [3]

Examiner commentary

The candidate has identified that the files could be lost, this same point is repeated on the next line; they could destroy his files.

No mark is given for 'mess up' his laptop because this terminology is too vague and does not describe the actions performed. They do get a second mark for a description of blackmail for these files which could be a possible eventuality.

Question 3 (a) (ii)

(ii) Describe **two** ways Hamish can help prevent unauthorised access to his laptop.

1 ....

....

....

....

2 ....

....

....

....

[4]

Exemplar 1   2 marks

1 Good, Strong password: Have a long password to containing Symbols., upper & lower case letters., numbers. Don't use your birthday.

2 Install anti-malware Software to ensure no malware is on the Computer which a hacker could use to gain unauthorised access.

[4]

Examiner commentary

The candidate has given password as the first way and given a suitable description of what makes a strong password.

The second response was a common error, anti-malware will help to prevent malware being installed, but will not help to prevent unauthorised access.

Exemplar 2

2 marks

1 Hamish could install software security such as firewalls to prevent unwanted intruders

2 Hamish could also set a very strong password as a deterrent for anyone willing to breach his information

[4]

Examiner commentary

The first response, firewall, is appropriate but they have not explained how it will prevent unauthorised access - they have repeated the question by saying it prevents unwanted intruders.

A strong password is given for the second way, but strong is not enough - candidates need to demonstrate and understanding of what this means.

Question 3 (b) (i)

(b) If unauthorised access does occur, Hamish would like to use encryption to add another layer of protection to his documents.

(i) Explain how encryption helps to protect Hamish's documents.

....

....

....

....

....

.... [2]

Exemplar 1   2 marks

Encryption scrambles all data present so it makes the data unreadable to anyone without a key. A key would be needed to read the data. [2]

Examiner commentary

The candidate has explained that encryption scrambles the data i.e. mixes it up. They are not given a mark for 'unreadable' because you can read the file it just doesn't make any sense i.e. it's not understandable. They do however expand this and say that a key is needed.

Exemplar 2   1 mark

It is the use of a code to make the hacker able to unable to read his documents one example would be the name Hamish they could replace every letter in hamish to one five letters down the alphabet so instead of Hamish it is MFFCALM [2]

Examiner commentary

This candidate has given a description of the process of encryption and shown that the data is scrambled of encoded and gains one mark for this. They did not gain a mark for being unable to read the data because the important aspect is that it cannot be understood.

Question 3 (b) (ii)

(ii)   One encryption method is a Caesar cipher.

This Caesar cipher moves each letter of the alphabet **one** place to the right.

The following table shows the original letters in the first row, and the new letters in the second row.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A

For example, if the message read: HELLO

This would be stored as: IFMMP

The following pseudocode algorithm takes a string of uppercase letters as input and uses the Caesar cipher to encrypt them.

The functions used in the algorithm are described in the table:

Function	Description
ASC(*character*)	Returns the ASCII value for *character* e.g. ASC("A") returns 65
CHR(*ASCIIvalue*)	Returns the single character for *ASCIIvalue* e.g. CHR(65) returns "A"
subString(*Value, Number*)	Returns the *Number* of characters starting at position *Value* (where 0 is the first character)

Complete the pseudocode algorithm to perform a Caesar cipher.

```
01 message = input("Please enter your string")

02 newMessage = ""

03 messageLength = message.length

04 for count = 0 to ...........................................................................

05     ASCIIValue = ASC(message.subString(.............................,1))

06     ASCIIValue = ASCIIValue + .............................

07     if ASCIIValue >90 then

08        ASCIIValue = ............................. - 26

09     endif

10     newMessage = ............................. + CHR(ASCIIValue)

11 next count
```

                                                                                              [5]

Exemplar 1   4 marks

```
01 message = input("Please enter your string")
02 newMessage = ""
03 messageLength = message.length
04 for count = 0 to ............. 25 .............
05     ASCIIValue = ASC(message.subString(...... Count ......,1))
06     ASCIIValue = ASCIIValue + ...... 1 ......
07     if ASCIIValue >90 then
08        ASCIIValue = ... ASCIIValue - 26
09     endif
10     newMessage = ...... newMessage ...... + CHR(ASCIIValue)
11 next count
```

[5]

Examiner commentary

This candidate got most of the answers correct, only the first one was incorrect as it should be messageLength. This was a common error with candidates thinking the loop was going through all 26 letters of the alphabet, and not each letter in the message.

Question 3 (b) (iii)

(iii) The algorithm needs adapting. An extra line (line 12) is needed to output the encrypted message.

Write line 12 to output the encrypted message in pseudocode or programming code.

....

.... [1]

Exemplar 1   0 marks

emessage = print (newmessage)

.... [1]

Examiner commentary

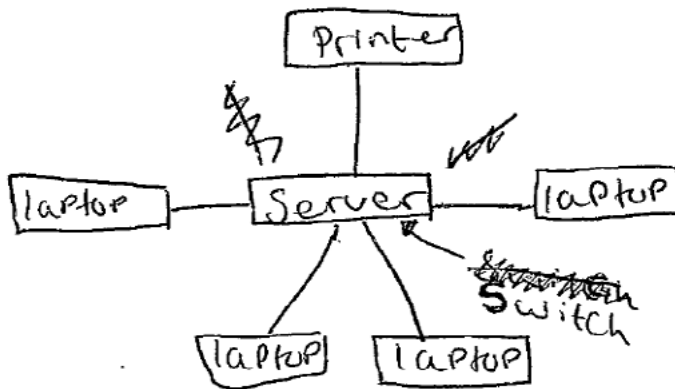This was a common error, where candidates attempted to assign the output message to a variable.

Question 4 (a) (i)

4   An office has a LAN (Local Area Network). The office has four employees who each have a laptop. The office also has one server and one networked printer.

   (a)   The office is set up as a star network with a switch at the centre. All devices are connected to the network using cables.

      (i)   Draw the devices and connections in the office star network. All devices must be clearly labelled.

[3]

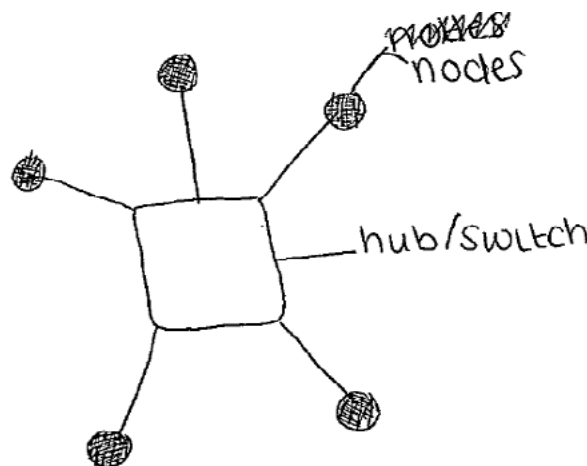## Exemplar 1   1 mark

[3]

Examiner commentary

A common error was candidates placing the server at the centre of the network instead of the switch. The server would be another component on the network and the switch may be directly attached to it; but the data goes to the switch before it goes to the server.

This candidate got one mark for putting four devices a server and printer on the diagram.

Exemplar 2   0 marks
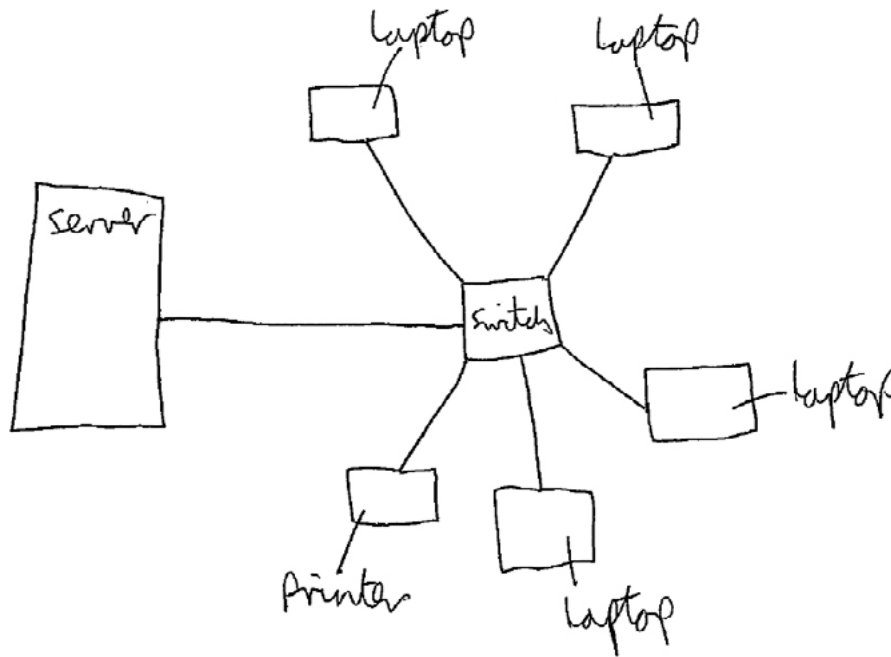

[3]

Examiner commentary

The central device has been written as hub/switch. These are different devices and the candidate is giving the option of one or the other, therefore the first response is marked which means it is a hub and therefore incorrect.

The candidate has identified nodes on the network but they have not said what these nodes are i.e. the printer, server and laptops.

Exemplar 3

3 marks

[3]

Examiner commentary

The candidate has drawn a box for, and labelled, four laptops, a server and a printer for MP1. They have a clearly identifiable switch (MP2) and all the devices are connected directly to the switch and no other device (MP3).

Question 4 (a) (ii)

(ii)   Describe the role of the switch in the office network.

....

....

....

.... [2]

Exemplar 1   2 marks

> ~~uses~~ uses mac address to send
> data to only the intended recipients
> computer.
> .... [2]

Examiner commentary

This candidate has given two clear points; they have identified that the switch makes use of MAC addresses of devices connected to it, and that it only sends data to the recipient.

Exemplar 2   1 mark

> The switch connects all the devices
> together and powers them
> .... [2]

Examiner commentary

The candidate has identified that it connects devices together, but it also says it powers them which is incorrect. Many candidates thought the switch powered the devices and/or turns them on and off.

Question 4 (b) (i)

(b) The office introduces a WAP (Wireless Access Point) to allow network access to wireless devices.

The office manager has noticed that the performance of the network has recently decreased.

(i) Describe how introducing wireless access could have slowed down the network.

....

.... **[2]**

Exemplar 1   0 marks

> The WAP would have to recieve the information from cabled devices and turn them into wireless signals and vice versa which takes more time.
>
> ....
>
> .... **[2]**

Examiner commentary

This candidate has described how a WAP would convert data received via cables into wireless signals, but this would not slow the network down as the data would likely need to be converted or passed to other devices at that point anyway. The question is wanting candidates to explain why wireless access is slower.

Exemplar 2   1 mark

> because now more information is being processed. This results in more traffic because more people are using the network
>
> ....
>
> ....
>
> .... **[2]**

Examiner commentary

This candidate has identified that there could be more traffic on the network - but has now expanded this to explain why this would slow the network i.e. that the bandwidth is divided between more users.

Question 4 (b) (ii)

(ii) Identify **two** other factors that can affect the performance of a network.

1 ....

....

2 ....

....

[2]

Exemplar 1   1 mark

1 Data transfer speed

2 Wether it is wireless or wired connection Network

[2]

Examiner commentary

The transfer speed is given a mark for the bandwidth. The second point is a repeat of the previous question part - the question asks for other factors, the 'other' referring to other than wireless vs wired, therefore this is a repeat point.

Question 4 (c)

(c) Explain what is meant by a Virtual Network.

....

.... [2]

Exemplar 1   0 marks

it is where a net work is virtual in the cloud so that more than one person can access content the same document and share it at the same time. And is all stored in there all in one place. [2]

Examiner commentary

This was a common error where candidates confused a virtual network with the cloud and gave a description of what the cloud is and how it could be used instead.

Exemplar 2   2 marks

A virtual network is a non-physical network which can be set up and be connected to from anywhere geographically (with access.) [2]

Examiner commentary

This candidate gave a clear definition of what a virtual network is. They declared it be non-physical, and that it can be connected to from anywhere that has access (presumably) to the Internet.

Question 5 (a)

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.

....

.... [5]

Exemplar 1   2 marks

The website has a unique IP address. The internet protocol address is just special code that translates to the URL. The IP address goes to the Domain name server and gets translated into the name of the web page. The URL is a platform that takes you to wherever the IP address is linked. The hyper transfer text protocol (secure) can interpret the IP address and then takes you to the web page. The (s) after (http) ; means secure So you are entering a Secure network

....

.... [5]

Examiner commentary

This candidate has identified that websites each have their own IP address, and that this is a translated form of a URL. They proceed to state the reverse of the actual process; that the IP address is sent to a DNS (instead of the URL being sent) and it gets translated into the website name (instead of URL being converted to IP).

Exemplar 2

5 marks

~~The~~ "OCR" is the domain name of the website, which is easier for the user to remember than an IP address. The webserver which host the OCR website, domain name server is then used to translate the domain name into its IP address. The computer then sends a request to the webserver hosting the website to send the website with the IP address associated with "OCR"s using the https protocol (in this case). The computer then server is then able to access the website with the domain name: OCR.

[5]

* The IP address is what is used to identify a website/device on the internet. The domain name server stores a log book of each domain name's accompanying IP address.

Examiner commentary

This candidate has identified that the DNS converts the domain name (from the URL) into the IP; this gets one mark for the translation, and one for identifying the URL and IP are equivalent.

They continue to say that the computer sends a request to the webserver and that the webserver stores the website. They describe the use of HTTP which is not a requirements of a question, then in the * section also identify that each website has an IP address.

Question 5 (b) (i)

(b) Computers access the Internet using the TCP/IP model.

(i) The TCP/IP model uses layers including the application layer and transport layer.

Explain why the TCP/IP model uses layers.

....

.... **[2]**

Exemplar 1   2 marks

(b) Computers access the Internet using the TCP/IP model.

(i) The TCP/IP model uses layers including the application layer and transport layer.

Explain why the TCP/IP model uses layers.
✻ transport,

layers are a step by step procedure that a file must go through. They are ~~╳╳╳~~, application ✻ Network and link. The layers can be individually taken out and edited indipendant of the others; and also a file can go through the layers one way when being sent, and back the other way when they are recieved. **[2]**

Examiner commentary

The candidate has given a description of the different layers in TCIP/IP but this is not what the question asked for. They proceed to explain the use of layers as that they can be individually changed, without affecting the others. This was the most common answers to gain full marks.

Question 5 (b) (ii)

(ii)   TCP/IP is one example of a protocol.

Give the name of **one** appropriate protocol for each task in the table.

Task	Protocol for this task
Sending an email from one mail server to another	
Transmitting a file from a client to a server	
Viewing a website using a web browser	
Downloading an email to your computer	

[4]

Exemplar 1   2 marks

(ii)   TCP/IP is one example of a protocol.

Give the name of **one** appropriate protocol for each task in the table.

Task	Protocol for this task
Sending an email from one mail server to another	~~FTP~~ HTTP
Transmitting a file from a client to a server	FTP
Viewing a website using a web browser	HTTPS
Downloading an email to your computer	URL

[4]

Examiner commentary

FTP and HTTP/HTTPS were most commonly correct as in this answer.

Exemplar 2   0 marks

(ii) TCP/IP is one example of a protocol.

Give the name of **one** appropriate protocol for each task in the table.

Task	Protocol for this task
Sending an email from one mail server to another	Transport
Transmitting a file from a client to a server	Datalink
Viewing a website using a web browser	~~Data Link~~ Application
Downloading an email to your computer	~~Application~~ Session

[4]

APPlication
Session
Transport
Datalink
Physical
presentation.

Examiner commentary

Following on from the previous question where candidates had to explain the use of layers, many candidates attempted to give a protocol layer for each of the tasks, instead of a protocol.

Exemplar 3   4 marks

(ii) TCP/IP is one example of a protocol.

Give the name of **one** appropriate protocol for each task in the table.

Task	Protocol for this task
Sending an email from one mail server to another	SMTP
Transmitting a file from a client to a server	FTP
Viewing a website using a web browser	HTTP
Downloading an email to your computer	POP

[4]

Examiner commentary

The candidate has given the correct protocol for each task and is given all 4 marks.

Question 6 (a)

6   Fiona is a software engineer. She is creating a new version of a computer game she released three years ago.

Fiona is considering selling the game online and not making it available physically in shops.

(a)   Describe the environmental impact of Fiona's decision.

....

.... [2]

Exemplar 1   2 marks

> this decision is better for the ~~~~ environment because the ~~~~ raw materials needed to create the storage device for ~~~~ the game, and the packaging requires a lot of energy to extract, creating lots of pollution and depleting finite natural resources. fiona's decision will thus avoid this. [2]

Examiner commentary

Many candidates answered this question well, most common answers as in this one was the reduction in use of raw materials, and less energy being required to extract, manufacture and transport the disks.

Exemplar 2   1 mark

> Fiona's decision has a positive impact on the environment, this is because a physical copy will require lots of plastic and some metal for the DVD, which ~~it~~ would have ~~needed~~ been needed. The online copy is easier to download, and doesn't have an effect on the environment. Therefore, Fiona has made a good decision. [2]

Examiner commentary

Many candidates gave long explanations of the same points, for example here they state that physical copies require plastic. They proceed to explain that online does not have an effect on the environment - but not how or why, and then conclude that she's made a good decision which does not answer the question of what the environmental impact is.

Question 6 (b)

(b) Fiona releases her game under a proprietary licence.

Explain why a proprietary licence is a more appropriate choice than open source.

....

.... [2]

Exemplar 1   0 marks

(b) Fiona releases her game under a proprietary licence.

→ *paid for., better quality, debugged, updated regularly*

Explain why a proprietary licence is a more appropriate choice than open source.

A proprietary licence is a more appropriate choice than open source because it is normally a better quality. This is because if the developers believe it is worth money then it has to reach high expectations. A proprietary licence also has a better & *public* image, as people will trust this over something which is free. Also, people like their software de-bugged and updated regularly. [2]

Examiner commentary

The candidate has stated that it is better quality - but this is not necessarily the case, and the term 'quality' could mean many different aspects. They proceed to explain that people will trust it more and will want it debugged and updated - but these could also be done with open source software, they are not unique to proprietary.

Exemplar 2   2 marks

If she uses proprietary, she will be able to get a profit from the game and noone will be able to see, or edit the source code, meaning it will always stay as the game she created. It also means people cannot plagerise her game if they cannot see the code. [2]

Examiner commentary

This candidate has identified that Fiona will be able to get profit from the game i.e. sell it for a cost, and that she can protect the source code. This has already gained two marks, but the explanation of people being unable to plagiarise the code would have been enough for the expansion mark.

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