Chhetri Academy

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GCSE COMPUTER SCIENCE

3.2

Edexcel 1CP2 | Specification point 3.2.2

The purpose and functionality of utility software (file repair, backup, data compression, disk...

Untiered

Answers and examiner comments

2	2023-2025	Untiered
question groups	available papers	tier

Using this booklet

1. Answer numbers match the companion question booklet.
2. Follow the original question number on marking tables.
3. Examiner comments are included where available.

Name _____ **Date** _____

Some entries use full source marking material in an appendix. Any unavailable mark schemes are identified beside the relevant answer.

Question Number	Answer	Additional Guidance	Mark
1(a)(i)	Award one mark for each correct cell: Bus / Role Control (1) / Carries a read signal to main memory Address (1) / Carries the memory location of a piece of data Data (1) / Carries an instruction from main memory to the CPU		(3)

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	The only correct answer is D *A is not correct because the ALU carries out operations, rather than stores data* *B is not correct because the clock is an electrical signal, it does not store data* *C is not correct because main memory is not a component within the CPU*		(1)

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	Award one mark for any of the following: • Machine code (1) • Binary (1) • Object code (1) • Executable code / an executable (1)		(1)

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	Award one mark for any of the following up to a maximum of two marks: • Compile/Compilation (1) • Interpret/Interpretation (1) • Assemble (1)	Allow compiler/compiling, interpreter/interpreting, assembler/assembling	(2)

Question Number	Answer	Additional Guidance	Mark
1(c)	The only correct answer is C *A is not correct because optical media does not use magnetic charges, unlike a hard disc* *B is not correct because the portability does not affect how data is read from it* *D is not correct because volatility is not what makes the media readable*		(1)

Question Number	Answer	Additional Guidance	Mark
1(d)	Award one mark for any of the following: • Forms part of another device / system (1) • Performs a single/dedicated/specific task (1)		(1)

Question Number	Answer	Additional Guidance	Mark
1(e)	Award one mark for each correct cell: **Code review carried out by** / **Disadvantage** By a programmer: • Adds additional/significant time (to the development cycle) (1) • Introduces human error (1) • Requires an extra person/resource/labour (1) • Requires more experienced programmer (1) By an automated system: • May not identify all issues (that it is not programmed to find) (1) • May only find well known problems (1)	Do not award cost of buying software or paying additional programmer, as given in the question. Do not accept: - 'algorithmic bias' - 'does not find logic errors'	(2)

Question Number	Answer	Additional Guidance	Mark
1(f)	The only correct answer is C *A is not correct because defragmentation software does not compress data* *B is not correct because defragmentation software does not encrypt data* *D is not correct because defragmentation software does not protect data*		(1)

Question Number	Answer	Additional Guidance	Mark
1(g)(i)	Award one mark for any of the following up to a maximum of two marks: • A scheduler/scheduling algorithm controls processes (1) • Each process gets a time slice/small amount of (CPU) time (1) • Processes are held in a data structure (1) • Each process may be held in order / priority (1) • Incomplete processes go to the back of the queue (1)	Allow use of 'program' instead of 'process' Award examples e.g. 'round-robin'. For MP3 – award any example of a data structure e.g. array, list, queue.	(2)

Question Number	Answer	Additional Guidance	Mark
1(g)(ii)	Award one mark for any of the following: • File management (1) • Peripheral management (1) • User management (1) • User interface (1)	Allow memory management Allow a specific example, only if it can clearly be attributed to one of the bullets	(1)

Question Number	Answer	Additional Guidance	Mark
2(a)	Award **one** mark for any of the following up to a maximum of **two** marks: • Control water temperature (1) • Select wash cycle (1) • Control timer (1) • Lock door (1) • Display time left (1) • Optimise water usage (1) • Weigh the load/monitor soil levels (1) • Control spin/drum speed (1)	Allow any specific function of a washing machine that could be controlled by an electronic embedded system Do not award wash clothes as this function is given in the question Do not award statements such as 'spin speed', 'temperature', 'cold wash' on their own without indication that these things are being controlled i.e. do not accept copying a label from the picture.	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(b)(i)	Award **one** mark for any of the following: • To store data/files/programs (1) • To backup data/files (in case of loss) (1) • To store BIOS/bootstrap/start up instructions (that are used when the computer is powered on) (1) • Non-volatile storage has higher capacity (than volatile) (1) • Non-volatile storage is more portable (than volatile) (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	Award **one** mark for: • Optical (1)	Allow CD, DVD, Blu-ray Disc	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(c)(i)	Award **one** mark for any of the following up to a maximum of **two** marks: • The source code is read/translated one line at a time (1) • The code is executed immediately after translation (1) • Errors are reported as soon as they are found (1) • Program translation/execution stops when an error is found (1)	Responses must refer to how the interpreter translates code. Do not accept benefits/drawbacks or comparisons to compilers.	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(c)(ii)	Award **one** mark for any of the following up to a maximum of **two** marks: • Mnemonics/key command words/shortened command words (1) • Hardware/chip/architecture specific / not portable across machines (1) • Manipulates contents of memory/registers/hardware features directly (1) • One assembly language instruction maps to one CPU operation/instruction (1)	Do not award: • hard to learn or no tools • must be translated • is low level Responses must relate to characteristics and not benefits or drawbacks relative to high-level languages.	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(c)(iii)	Award **one** mark for: • **Audit** trail/log (1)	Do not award: • change log • version control Responses must specify **audit**.	**(1)**

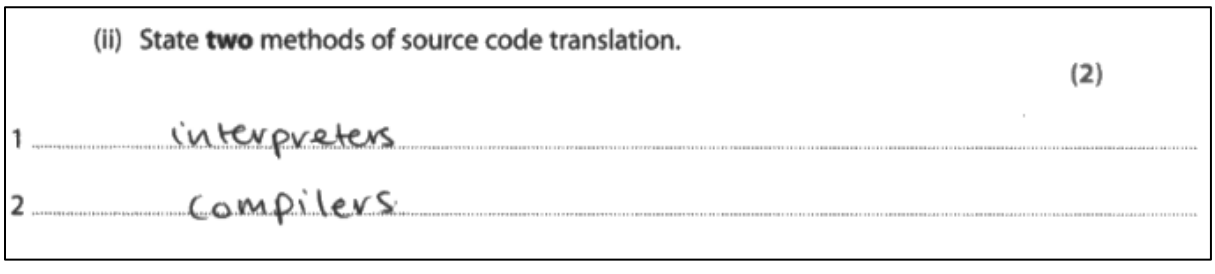
Question Number	Answer	Additional Guidance	Mark
2(d)	Award up to **two** marks for a linked description such as: • Processes/programs/instructions/data (not using the CPU) are temporarily moved out of RAM/main memory (1) into secondary storage/on the hard disk/SSD (1) • When it is time for a process to use the CPU and it is stored in secondary storage/on hard disk/SSD (1) it is swapped back into RAM/main memory (1) • RAM/main memory is divided into pages (allocated to each process) (1) and a paging algorithm swaps processes between RAM/main memory and secondary storage/hard disk/SSD (1)	For both marks, the expansion must follow/associate with the statement. Do not award • names of scheduling algorithms • RAM/memory being full	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(e)	Award up to **two** marks for a linked explanation, such as: • If a file is corrupted (1) content can be retrieved (1) • A file is corrupted (1) because of a hardware fault (1) • A file cannot be opened (1) because it is damaged/corrupted (1) • Files can be moved from one area of a disk to another/recovered (1) because part of the disk has been/is corrupted (1) • Reconstruct files/extract parts of a file (1) because part of the disk is corrupted (1)	For both marks, the expansion must follow/associate with the statement.	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(f)	Award **one** mark for each correct cell: A. Control Unit/CU (1) B. Address Bus (1) C. Clock (1) D. Memory/Main Memory/RAM (1)	Allow ROM for RAM	**(4)**

Question 1bii

Some students understood methods of source code translation, referring to it in different ways, e.g. interpreter/compiler. A common mistake was referring to 'translation', which was in the question. Some students incorrectly used terms such as code, hex, binary, ascii.


(ii) State **two** methods of source code translation. (2)

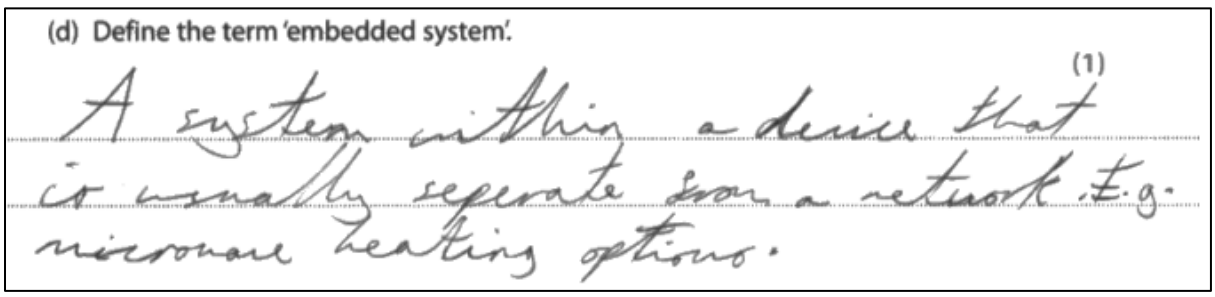
1 interpreters

2 compilers

This response scored 2 marks.

Question 1d

Many students showed an understanding of the idea that an embedded system is a (small) system contained within another system or one that performs a specific or dedicated task.


(d) Define the term 'embedded system'. (1)

A system within a device that is usually seperate from a network. E.g. microwave heating options.

This response scored 1 mark for 'system within a device'.

Question 1e

Adds time and human error were the most common answers for the first part and many got the second part incorrect by stating something to do with algorithmic bias, or mentioned logic errors.

(e) A code review is carried out by a programmer or an automated system.

Both methods cost money.

Complete the table with **one other disadvantage** for each method.

(2)

Method of code review	Disadvantage
By a programmer	Takes longer to complete
By an automated system	May not spot all errors ~~mage~~ made.

This response scored 2 marks; 1 mark for 'takes longer' and another mark for 'may not spot all errors'.

(e) A code review is carried out by a programmer or an automated system.

Both methods cost money.

Complete the table with **one other disadvantage** for each method.

(2)

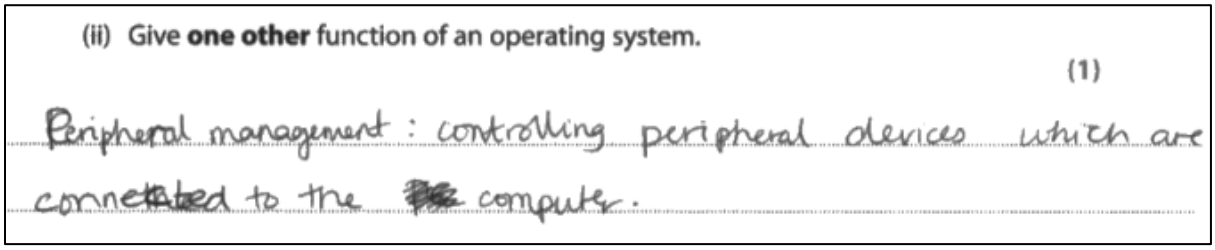
Method of code review	Disadvantage
By a programmer	could missread code
By an automated system	~~doesn't help to fix it in fut~~ unethical

The first response is an example of human error, so mark point is implied, 1 mark.

Many students gained the mark for referring to scheduling or priority order, but few responses linked these together for two marks. Many mentioned multitasking or the fetch decode and execute cycle, and buses, rather than answering the question. Students sometimes effectively talked about the management of tasks and allocating system resources.

Question 1gii

There was a good spread in terms of the options chosen for students' responses out of the possible functions of the operating system. However, the use of the terms 'control' and 'organise' were used for files, but without expanding on them to provide context.


(ii) Give **one other** function of an operating system.

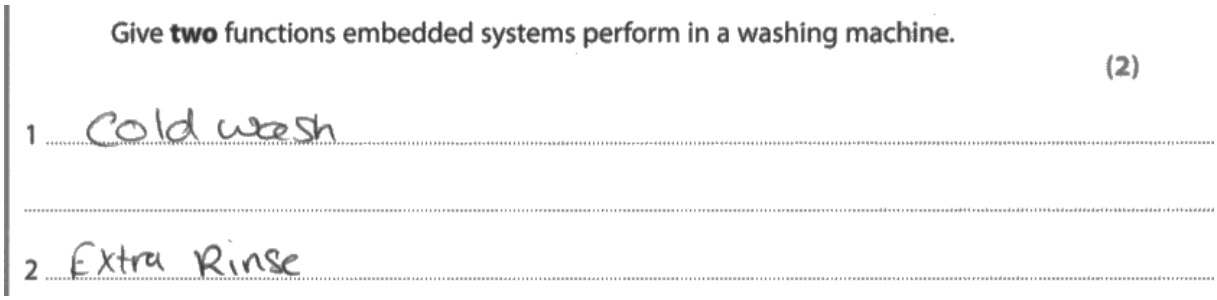
(1)

Peripheral management : controlling peripheral devices which are connected to the [redacted] computer.

This response scored 1 mark for 'peripheral management'.

Question 2(a)

Many candidates gave vague responses or copied labels from the photo stimulus given in the question such as 'wash temp'. This did not give the function of the related embedded system which was to monitor the water temperature until it reached the required temperature. In general, responses needed to be more specific as to what was being controlled.


Give **two** functions embedded systems perform in a washing machine.

(2)

1 Cold wash

2 Extra Rinse

ResultsPlus
Examiner Comments

This response scored 0 marks. It copied labels from the photograph in the question without identifying specific control systems that would be used.

Question 2(b)i

Many candidates identified reasons for using non-volatile storage such as storing the BIOS or storing programs/data permanently. Where candidates drew comparisons between volatile storage, and RAM in particular, they were awarded a mark for a valid comparison such as higher storage capacity.

(b) Computers use different types of storage.

(i) Non-volatile storage keeps its content when the power is turned off.

Give **one other** reason why computers use non-volatile storage.

(1)

To store the bootstrap that helps start the computer.

ResultsPlus
Examiner Comments

This response gained 1 mark for identifying that non-volatile storage is often used to store the BIOS/bootstrap sequence.

Question 2(b)ii

Most candidates identified optical storage media as the correct response.

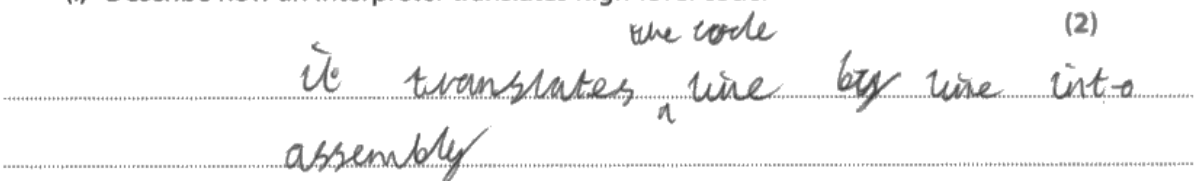
Question 2(c)i

Many candidates were able to state that an interpreter translates high-level source code one line at a time, but fewer were able to identify a second point such as code is executed immediately after translation. A number of candidates confused interpretation with compilation and wrote that the source code was translated into machine code.

(c) Programmers write code.

(i) Describe how an interpreter translates high-level code.

(2)

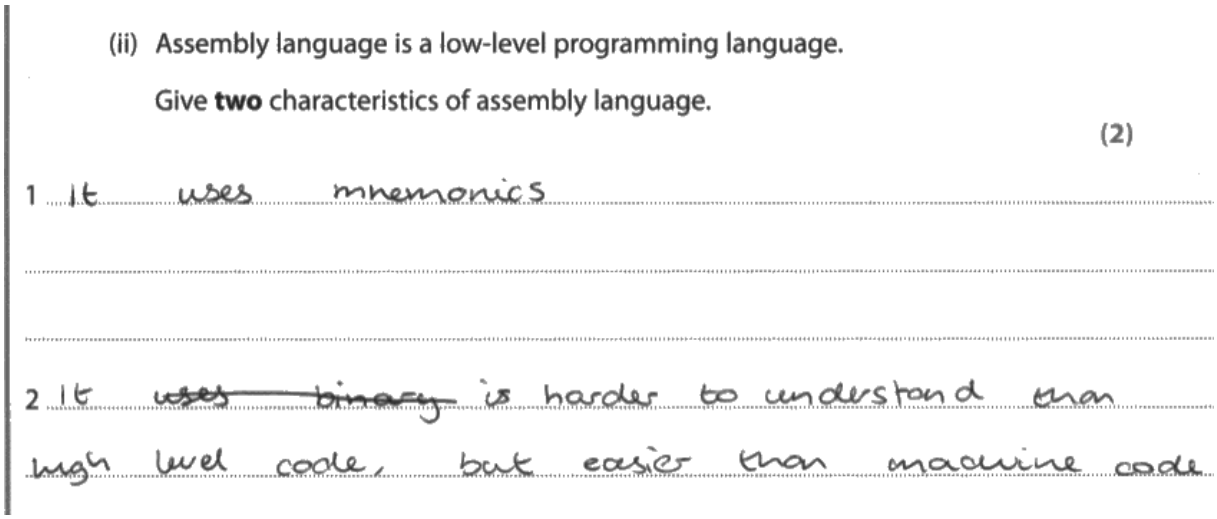


ResultsPlus
Examiner Comments

This response scored 1 mark for identifying that interpreters translate source code line-by-line. It did not go on to expand upon this point to form a linked description.

Question 2(c)ii

Some candidates confused characteristics with benefits and drawbacks and erroneously gave responses that compared writing code in assembly language with writing code in a high level language. Where candidates did list characteristics of assembly language, they frequently cited that mnemonics were used (although often spelt incorrectly) to represent instructions and that assembly was architecture specific.



(ii) Assembly language is a low-level programming language.

Give **two** characteristics of assembly language.

(2)

1 It uses mnemonics

2 It ~~uses binary~~ is harder to understand than high level code, but easier than machine code

ResultsPlus
Examiner Comments

This response scored 1 mark for identifying that assembly language uses mnemonics. It did not gain a mark for the second point made because that is a drawback of using assembly language rather than a characteristic.

Question 2(c)iii

Audit trail was commonly identified correctly.

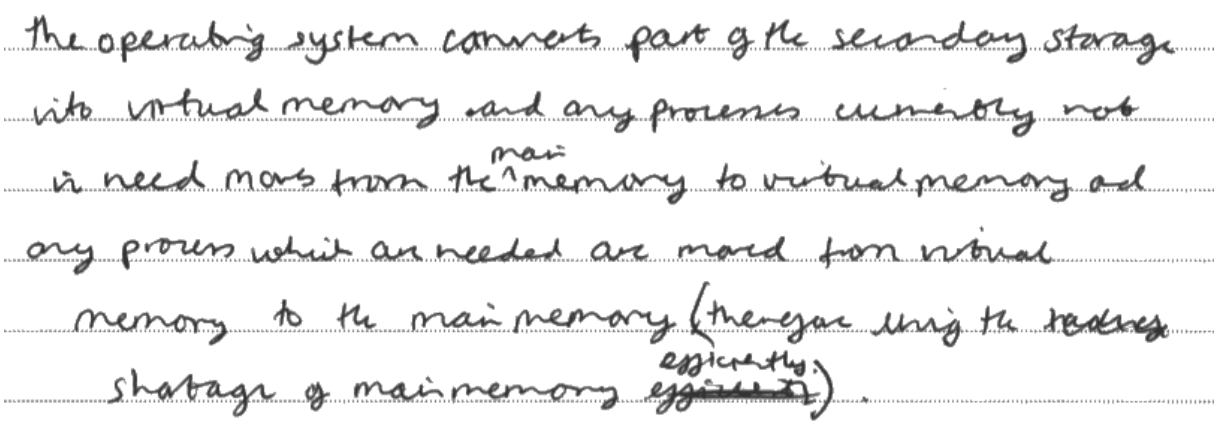
Question 2(d)

Most candidates struggled with the concept of virtual memory and how it is used in process management. The need to understand how virtual memory is used in process management is flagged in the Getting Started Guide. Many candidates' responses were vague and alluded to the use of virtual memory when main memory ran out. Few candidates were able to accurately describe how inactive processes could be temporarily moved out of RAM to secondary storage to free up space in RAM until such time as they were required again. A common misconception was to confuse virtual storage with cloud storage.

(d) One role of the operating system is to allocate memory to processes.

Describe how the operating system makes use of virtual memory when there is a shortage of main memory.

(2)



ResultsPlus
Examiner Comments

This response scored 2 marks for clearly identifying that processes not currently being used can be transferred from RAM to secondary storage to free up RAM for other processes to use and then retrieved from the virtual memory when required.

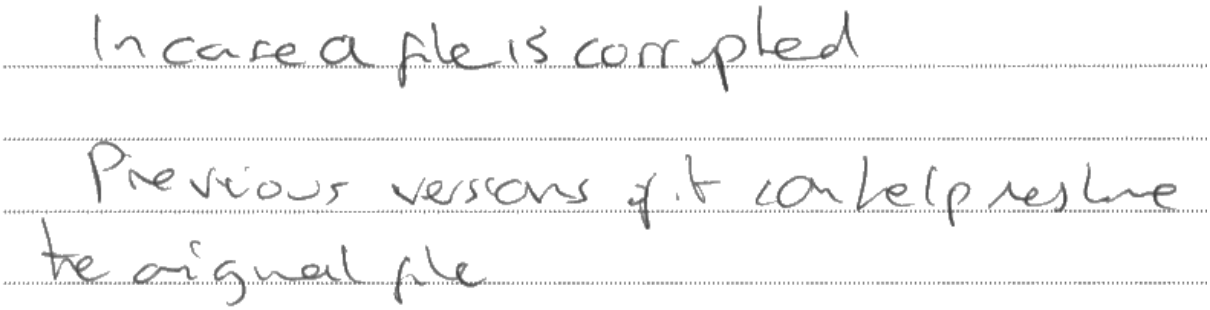
Question 2(e)

Whilst some candidates gave clear explanations that file repair utility software is used to retrieve data from corrupted files, many candidates gave very vague answers. Stating that fail repair software is used to repair files was not creditworthy.

(e) File repair is a type of utility software.

Explain **one** reason why file repair software is needed.

(2)



ResultsPlus
Examiner Comments

This response scored 1 mark for the initial identification of using file repair software when a file is corrupted. However, the next sentence referred to backup software for previous versions and not file repair software to retrieve content from corrupted files.

Question 2(f)

Most candidates correctly identified a number of the labels on the microprocessor diagram. Common errors included stating CPU instead of CU for Label A or being too vague and saying 'bus' or 'memory bus' instead of 'address bus' for Label B.

Identification of the clock for Label C was the least well answered part of the question.