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GCSE COMPUTER SCIENCE

1.5

OCR J277 | Specification point 1.5.1

Operating systems

Untiered

Past paper question booklet

3	2020-2025	Untiered
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

5 Ali's tablet computer has an operating system.

(a) Complete the following description of the functions of an operating system by selecting the appropriate missing words from those in the box.

user	drivers	directories	hardware	interface	multitasking
output	peripherals	printers	processor	RAM	utility
ROM	running	passwords	faster	volatile	virtual

The operating system provides a user ..... . This displays the output to the user and allows the user to interact with the ..... .

The operating system controls the movement of data from secondary storage to ..... and vice-versa. This is known as memory management.

The operating system can only perform one process at a time, but by managing the memory the computer can appear to be completing more than one process at a time. This is known as ..... .

An operating system allows device ..... to be installed to allow an external piece of hardware to interact with the ..... .

The operating system provides security through user accounts and ..... . It also creates and maintains a file system to organise files and ..... . **[8]**

(b) Ali runs defragmentation analysis on his magnetic hard disk. Parts of the results are shown.



	File 1
	File 2
	File 3
	Free space

(i) Explain how defragmentation will change how the files and free space are arranged on Ali's hard disk.

.....

.....

.....

.....

.....

.....

..... **[3]**

(ii) After defragmentation, Ali's computer is able to access files faster.

Explain why Ali's computer can access the files faster after defragmentation.

.....

.....

.....

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

(iii) Give **three** additional examples of utility programs.

1 .....

2 .....

3 .....

[3]

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(c) Ali's computer uses virtual memory. Ali has written two procedures to help himself understand how virtual memory works.

`storeData()` describes how data is stored in RAM.
`accessData()` describes how data is read from RAM.

Write the letter of the missing statements from the table in the correct place to complete the algorithms. Not all statements are used, and some statements might be used more than once.

```
procedure storeData()
    if RAM is ..... then
        move data from RAM to .....
    endif
    store data in next free space in .....
.....
procedure accessData()
    if  ..... (data required is in RAM) then
        if RAM is full then
            move unneeded data from RAM to HDD
        endif
        move required data from HD to RAM
    endif
    read data from .....
endprocedure
```

Letter	Statement
A	Secondary storage
B	NOT
C	Full
D	endfunction
E	Empty
F	endprocedure
G	AND
H	RAM

[6]

(d) Ali's tablet computer also has ROM (read only memory).

Describe the purpose of ROM in Ali's tablet computer.

.....

.....

.....

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

(e) Ali thinks his tablet is an embedded system.

State whether Ali is correct or incorrect, justifying your choice.

Choice .....

Justification .....

.....

.....

.....

.....

.....

[3]

(f) Ali's tablet computer has 100 GB of secondary storage. There is currently 80 GB available.

Ali wants to transfer a series of video clips onto his tablet. Each video is, on average, 200 000 kilobytes.

Calculate an estimate of the number of video clips Ali can fit onto his tablet.

Show your working.

Working: .....

.....

.....

.....

Answer: .....

[4]

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3 A computer has an operating system and utility software.

(a) The table contains operating system functions and a task that each function performs.

Complete the table by writing the two missing function names and a task performed by the two given functions.

Function	Task
	Moves data from secondary storage to RAM
Peripheral management	
	Allows the user to create, name and delete folders
User interface	

[4]

(b) Complete the description of utility system software using the words provided in the box. Not all words are used.

access	amount	apart	compression	consecutive
defragmentation	deleted	encryption	key	lock
quantity	separate	speed	understood	

..... software changes data using a ..... . If the changed data is intercepted, it cannot be ..... . This software does not stop the data from being intercepted.

..... software analyses the data on a disk to find files that have been split and stored in separate locations. The split files are moved to be ..... in storage and the free space is moved together. This does not provide more storage space on the disk, instead it makes the ..... of the data faster because the read head does not have to move as far to access the next part of the file.

[6]

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2 A computer has an operating system.

(a) Tick (✓) **one** box on each row to identify the operating system function that will manage each task.

Operating system function	Memory management	Peripheral management	User management	File management
Multitasking				
Renaming a folder				
Creation of user accounts				
Installation of a printer driver				
Transfer of data to and from RAM				

[5]

(b) A computer also has utility software.

(i) State the purpose of utility software in a computer.

.....

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

(ii) Explain the purpose **and** function of encryption software.

.....

.....

.....

.....

.....

..... **[3]**

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