

**AQA Computer Science A-Level**  
**4.2.1 Data Structures and Abstract Data  
Types**  
Past Paper Questions

## June 2017 Paper 1

The data structures used by the game could be static or dynamic.

0 5 . 5

Explain the differences between static and dynamic data structures.

**[2 marks]**

## June 2013 Comp 3

- 8 An interactive operating system maintains a list of the processes that are currently waiting to execute (run). The processes are stored in order of the priority that is associated with their execution. This priority can be set as "High", "Normal" or "Low".

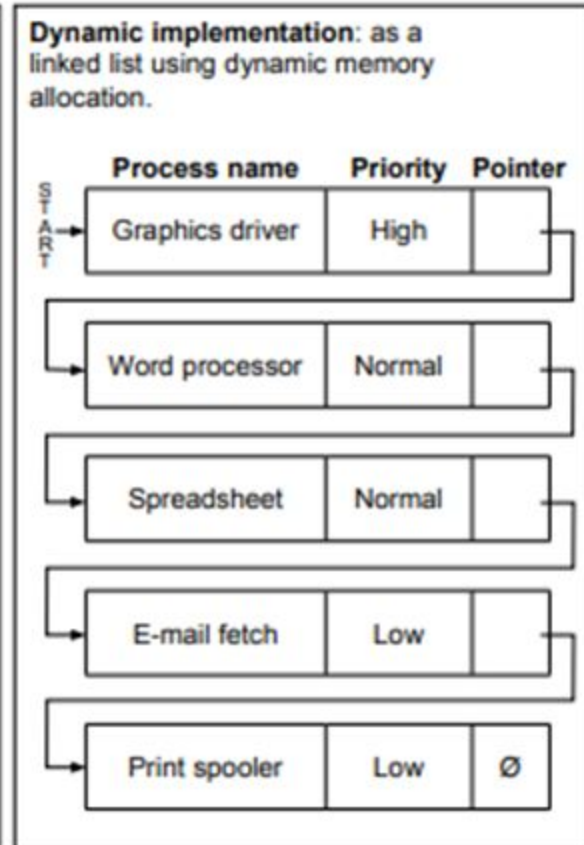
Figure 10 and Figure 11 below show two different ways in which the storage of the process list could be implemented.

Figure 10

**Static implementation:** as an ordered list using a fixed size array.

Index	Process name	Priority
[1]	Graphics driver	High
[2]	Word processor	Normal
[3]	Spreadsheet	Normal
[4]	E-mail fetch	Low
[5]	Print spooler	Low
⋮		
[100]		

Figure 11



The process at the start of the list will be run next. In Figure 10 and Figure 11, this is the "Graphics driver" process.

When a new process is initiated it is inserted into the list immediately after the last process of the same priority. A "Computer game" process with "High" priority would be inserted into the list in Figure 10 and Figure 11 between the "Graphics driver" and "Word processor" processes.

When a process is completed it is deleted from the list.

8 (a) Explain **two** differences between a dynamic data structure and a static data structure.

Difference 1: .....

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Difference 2: .....

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(2 marks)

8 (b) The **static implementation** is less efficient at inserting new items into the list than the **dynamic implementation**.

Explain why this is the case.

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(2 marks)