14. A laptop computer supplements its primary memory by making use of virtual memory.

(a) Outline the use of paging in relation to virtual memory. [2]

The laptop has 1GB of random access memory (RAM) and a single processor.
The laptop is using one of the latest operating systems to run multimedia gaming programs.

(b) Explain the limitations and consequences of using the laptop for this purpose. [3]

One of the laptop's game applications stores the data relating to the different actions of one of its characters in a stack.

(c) Suggest **one** reason why the character's actions might be stored in a stack. [2]

At specific moments during the game this data is read from the stack (`S`) into a queue (`Q`).

(d) Using appropriate access methods for stacks and queues, construct an algorithm that reads the data from the stack and enters it into the queue. You should assume that the queue structure exists and that both structures are of a fixed size. [6]

(e) Outline **one** advantage of making the queue dynamic. [2]

15. The collection `WEATHER` contains the temperatures that have been measured for one city over the course of **one week**, starting on Monday and ending on Sunday. Each day, 24 readings were taken, one each hour, the first being at 00:00, the second at 01:00 and so on. The data is stored in chronological order with the data for Monday stored in the collection first, followed by Tuesday and so on.

(a) State the total number of readings that were taken during this week. [1]

(b) Construct the algorithm to read this data into a 2D array, `A`, that would allow the temperature on a specific day at a specific time to be accessed directly. [4]

(c) Construct the algorithm that will output the day, as a word (for example Tuesday), on which the highest temperature was recorded. [6]

The process described at the start of question 15 is extended so that each week the value and date of the highest temperature recorded that week are stored chronologically in a collection, `HIGHEST`.

At any point in time, the data from the `HIGHEST` collection can be read into a suitable data structure that will allow the details of the highest temperatures recorded to be output in descending order. The structure is chosen in order to minimize processing.

(d) Explain how a suitable data structure can be constructed and used for this purpose. [4]