"3-a-day" A-Level Exam Practice Unit 1 (002)

Question 1

The size of some data structures is fixed when the structure is created.

State the term used to describe such data structures.

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Give **one** example of a type of data structure whose size is always fixed.

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Give **one** advantage of using a fixed size data structure.

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

Question 2

A queue data structure has two pointers called **front** and **next** which are defined as:
front points to the first item in the queue
next points to the next available space

The queue is defined as a first in, first out (FIFO) data structure.

(b) (i) State the condition of the pointers when the queue is empty.

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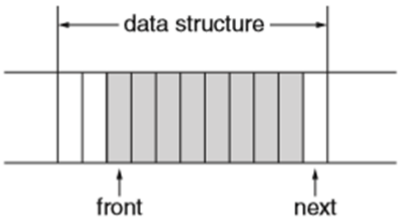
..... **[1]**

Question3

(c) The queue may be represented by a fixed size data structure.



Explain, with the aid of a diagram, what happens when attempting to add 3 data items to the queue.

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..... **[5]**

Answer 1

(i) (ii) (iii)	• static • array • amount of storage is known/easier to program		3	[Max 1 per dotty] (ii) fixed length record

Answer 2

(i)	•	pointers have same value/point to same location	1

Answer 3

(c)		• 1st value added to queue… • …**next** moved to front of data structure (circular queue) • 2nd value added at **next** and **next** incremented • test for queue full/**next**=**front**-1/report error • diagram showing 1st movement of **next** pointer	5

accept use of flag for testing error report must be before attempting to add 3rd data item