4 An examination paper has a maximum of 75 marks. One of five pass grades (A to E) is assigned, depending on the mark obtained. The lowest mark for a given grade is known as the grade boundary.

A program is being written to process examination marks.

The five grade boundaries are stored in a global 1D array `GB` of type `INTEGER`, for example:

Index	Value	Comment
1	65	The minimum mark for an A grade.
2	57	The minimum mark for a B grade.
3	43	The minimum mark for a C grade.
4	35	The minimum mark for a D grade.
5	27	The minimum mark for an E grade.

Any paper that achieves a mark within 2 marks of a grade boundary must be checked. Using the given table, a paper with 45 marks would need to be checked.

(a) The pseudocode algorithm to determine whether a paper should be checked is as shown. The mark for the paper is stored in variable `Mark`. Global variables `Mark`, `Index`, `Upper` and `Lower` are declared as integers.

Complete the pseudocode.

```
FOR Index ← 1 TO .....
   Lower ← GB[Index] - 2
   Upper ← .....
   IF Mark ..... AND Mark ..... THEN
      OUTPUT "Check this paper"
   ENDIF
NEXT Index
```

[4]

(b) An alternative algorithm to determine if a paper needs to be checked uses a global 1D array `Check`, containing 76 elements of type `BOOLEAN`. The indices of the array are from 0 to 75 (inclusive), corresponding to the range of possible marks.

An element value in `Check` is `TRUE` if the index is within 2 marks of a grade boundary. For example, in the case where the C grade boundary is 43 the corresponding part of the `Check` array would be as follows:

Index	Value	
40	FALSE	
41	TRUE	
42	TRUE	
43	TRUE	← The grade boundary for a C grade
44	TRUE	
45	TRUE	
46	FALSE	

(i) The mark for a given paper is stored in variable `Mark`.

Describe how an algorithm would use the `Check` array to determine whether this paper should be checked.

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..... [2]

(ii) A procedure `GBInitialise()` will initialise the `Check` array using values from the `GB` array.

Note it can be assumed that the maximum grade boundary value for A is 70 and the minimum value for E is 15.

Write pseudocode for the procedure.

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