

8. A program should generate a list of unique random integers between a lower and upper limit as chosen by the user.

MARKS

DO NOT WRITE IN THIS MARGIN

Enter the number of values	7
Enter the minimum value	0
Enter the maximum value	20
The values are	1,5,7,9,13,15,19

- (a) Identify two boundaries of this problem.

2

The function `validNum` is used to check if a number is already present in the array or not.

When the code is tested an error is found.

```
...
Line 34  FUNCTION validNum(INTEGER randomNum,
                        ARRAY OF INTEGER values) RETURNS BOOLEAN
Line 35      DECLARE valid INITIALLY FALSE
Line 36      FOR index FROM 0 TO length(values) - 1 DO
Line 37          IF values[index] = randomNum THEN
Line 38              SET valid TO FALSE
Line 39          END IF
Line 40      END FOR
Line 41      RETURN valid
Line 42  END FUNCTION
...
Line 63  DECLARE randomList as ARRAY OF INTEGER
        INITIALLY [0] * <size of array>
Line 64  FOR index FROM 0 TO length(randomList) - 1 DO
Line 65      randomVal = <random number between minimum value
                    and maximum value>
Line 66      WHILE validNum(randomVal,randomList) = FALSE
Line 67          randomVal = <random number between minimum value
                    and maximum value>
Line 68      END WHILE
Line 69      SET randomList[index] TO randomVal
Line 70  END FOR
...
```



8. (continued)

(b) The error is found to be in the function `validNum` shown in lines 34 to 42.

(i) Identify the error in the function.

1

(ii) Describe the effect of this error when lines 63 to 70 are executed.

2

(c) The error has been corrected and the code now executes as expected.

Describe how the `validNum` function could be made more efficient.

2

(d) Formal and actual parameters are used in the code.

Identify a formal parameter for the `validNum` function and its associated actual parameter.

2

Formal parameter _____

Actual parameter _____

[Turn over

