Programming Theory Questions

These questions refer to the Preliminary Material and require you to load the Skeleton Program, but do not require any additional programming.

1. State the name of an identifier for:

   (a) A two-dimensional array (1 mark)

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   (b) A function with no parameters (1 mark)

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   (c) A constant that can only store a whole number (1 mark)

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   (d) A function that returns an integer (1 mark)

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   (e) A variable that stores a string value (1 mark)

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   (f) A subroutine that calls more than one other subroutine (1 mark)

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   (g) A variable that stores a Boolean value (1 mark)

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2. Write three lines of code from the skeleton program that each call different library subroutines. (3 marks)

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3. Look at the function `InitialiseField`. Describe the purpose of the variable `Response`. (2 marks)

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4. The skeleton program utilises the variable `Field`.

   (a) State the data structure held by `Field`. (1 mark)

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   (b) Explain how data is stored and used in this data structure. (3 marks)

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5. State the purpose of the following instruction in the `ReadFile` function? (1 mark)

```
FileHandle = open(FileName, 'r')
```

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6. Describe what would happen if, during execution of the `ReadFile` function, the user entered a file name for a file that does not exist. (2 marks)

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7. Describe the purpose and operation of the nested loop in the `Display` subroutine. (3 marks)

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8. Explain the operation of the `SeedLands` function, including any parameters and return values. (5 marks)

9. `Simulation` is a procedure, whereas `SeedLands` is a function.
Describe the difference between a procedure and a function. (2 marks)

10. Describe the purpose of the following code in the `CreateNewField` function? (4 marks)

```
Row = FIELDLENGTH // 2
Column = FIELDWIDTH // 2
Field[Row][Column] = SEED
```


11. Look at the function `SimulateSpring`. Describe the purpose and use of the variable `Frost`. (2 marks)

12. The skeleton program begins with a number of constants.
Describe two benefits of the program being written in this way. (2 marks)

13. The subroutine `Simulation` uses a While loop, and the function `SimulateWinter` uses a For loop.
Describe the difference between a While loop and a For loop.
You do not need to address nesting in your answer. (2 marks)

14. The procedures `Display` and `CountPlants` both use local variables called `Column`. An alternative approach would have been to create a single global variable called `Column`.
Describe the advantages of using local variables and the advantages of using a global variable. (4 marks)

15. Describe what is meant by 'string concatenation', and write down an instruction, taken from the skeleton program, that uses string concatenation. (2 marks)

16. Explain the purpose of the following instruction in the `SimulateSummer` function: (3 marks)

```
Field[Row][Column] = SOIL
```

17. Describe the purpose of the following instruction in the `SimulateSummer` function: (2 marks)

```
RainFall = randint(0, 2)
```

TOTAL MARKS

/50

