

A-Level Computer Science

Name: _____ Score: _____

1. Which data type best stores a yes/no flag like "in stock"?
 - ☐ DATE
 - ☐ STRING
 - ☐ BOOLEAN
 - ☐ REAL
2. An array stores:
 - ☐ several fields of different types
 - ☐ a single value
 - ☐ many items of the same type, reached by an index
 - ☐ only text
3. Why does a program write data to a file rather than keeping it in a variable?
 - ☐ variables in RAM are lost when the program ends; a file persists
 - ☐ files use no storage
 - ☐ variables cannot hold numbers
 - ☐ files are always faster than RAM
4. An Abstract Data Type (ADT) is defined by:
 - ☐ the programming language only
 - ☐ what operations it offers, hiding how the data is stored
 - ☐ the exact memory addresses it uses
 - ☐ the size of the screen
5. Pushing an item onto a stack that is already full causes a stack _____.

6. A real (floating-point) type should be used to store a measurement such as a temperature.
 - ☐ True ☐ False
7. An array is a data structure holding many values of the _____ type under one name.

8. To add lines to the end of an existing file without losing its contents, open it FOR _____.

9. A stack works in which order?

- ☐ random order
- ☐ LIFO – last in, first out
- ☐ sorted order
- ☐ FIFO – first in, first out

10. Which belong in the declaration and initialisation of an array-based stack? Select **all** that apply.

- ☐ a MaxSize the push operation compares against
- ☐ an array with its size and element type
- ☐ a top-of-stack pointer initialised to 0
- ☐ a front pointer for the next item to leave

Tick every correct option.

1. BOOLEAN

A flag has two states, so BOOLEAN (TRUE/FALSE) is the precise choice – not the strings "yes"/"no".

2. many items of the same type, reached by an index

An array is an ordered collection of same-type items accessed by index. (A record groups different types.)

3. variables in RAM are lost when the program ends; a file persists

RAM is volatile, so data is lost on exit. A file on secondary storage persists between runs.

4. what operations it offers, hiding how the data is stored

An ADT specifies the operations (the interface); the implementation is hidden and can change freely.

5. overflow

Overflow = push when $\text{Top} = \text{MaxSize}$; popping from an empty stack ($\text{Top} = 0$) is underflow.

6. True

Whole counts use integers; measurements use reals.

7. same

Each value is reached by its index.

8. APPEND

WRITE would start the file empty. APPEND keeps what is there and writes after it.

9. LIFO – last in, first out

A stack is LIFO: the most recently pushed item is the first to be popped.

10. a MaxSize the push operation compares against; an array with its size and element type; a top-of-stack pointer initialised to 0

A stack needs one pointer, Top. A front pointer belongs to a queue.