Cambridge Assessment International Education

# Cambridge International AS & A Level

**COMPUTER SCIENCE** **9618/21**

Paper 2 Fundamental Problem-solving and Programming Skills **October/November 2023**

INSERT **2 hours**

*0113520592-I*

**INFORMATION**

- This insert contains all the resources referred to in the questions.
- You may annotate this insert and use the blank spaces for planning. **Do not write your answers** on the insert.



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An error will be generated if a function call is not properly formed or if the parameters are of an incorrect type or an incorrect value.

**String and character functions**

- A string of length 1 may be considered to be either of type CHAR or STRING
- A CHAR may be assigned to, or concatenated with, a STRING
- A STRING of length greater than 1 cannot be assigned to a CHAR

```
LEFT(ThisString : STRING, x : INTEGER) RETURNS STRING
```

returns leftmost x characters from ThisString
Example: LEFT("ABCDEFGH", 3) returns "ABC"

```
RIGHT(ThisString : STRING, x : INTEGER) RETURNS STRING
```

returns rightmost x characters from ThisString
Example: RIGHT("ABCDEFGH", 3) returns "FGH"

```
MID(ThisString : STRING, x : INTEGER, y : INTEGER) RETURNS STRING
```

returns a string of length y starting at position x from ThisString
Example: MID("ABCDEFGH", 2, 3) returns "BCD"

```
LENGTH(ThisString : STRING) RETURNS INTEGER
```

returns the integer value representing the length of ThisString
Example: LENGTH("Happy Days") returns 10

```
TO_UPPER(x : <datatype>) RETURNS <datatype>
```

<datatype> may be CHAR or STRING

returns an object of type <datatype> formed by converting all characters of x to upper case.

Examples:

- TO_UPPER("Error 803") returns "ERROR 803"
- TO_UPPER('a') returns 'A'

```
TO_LOWER(x : <datatype>) RETURNS <datatype>
```

<datatype> may be CHAR or STRING

returns an object of type <datatype> formed by converting all characters of x to lower case.

Examples:

- TO_LOWER("JIM 803") returns "jim 803"
- TO_LOWER('W') returns 'w'

```
NUM_TO_STR(x : <datatype1>) RETURNS <datatype2>
```

returns a string representation of a numeric value.
<datatype1> may be REAL or INTEGER, <datatype2> may be CHAR or STRING
Example: NUM_TO_STR(87.5) returns "87.5"
If x is a negative value, the returned value will be a string beginning with the '–' character.

```
STR_TO_NUM(x : <datatype1>) RETURNS <datatype2>
```

returns a numeric representation of a string.
<datatype1> may be CHAR or STRING, <datatype2> may be REAL or INTEGER
Example: STR_TO_NUM("23.45") returns 23.45

`IS_NUM(ThisString : <datatype>) RETURNS BOOLEAN`

returns `TRUE` if `ThisString` represents a valid numeric value.
`<datatype>` may be `CHAR` or `STRING`
Example: `IS_NUM("-12.36")` returns `TRUE`

`ASC(ThisChar : CHAR) RETURNS INTEGER`

returns an integer value (the ASCII value) of `ThisChar`
Example: `ASC('A')` returns `65`, `ASC('B')` returns `66`, etc.

`CHR(x : INTEGER) RETURNS CHAR`

returns the character whose integer value (the ASCII value) is `x`
Example: `CHR(65)`returns `'A'`, `CHR(66)`returns `'B'`, etc.

**Numeric functions**

`INT(x : REAL) RETURNS INTEGER`

returns the integer part of `x`
Example: `INT(27.5415)` returns `27`

`RAND(x : INTEGER) RETURNS REAL`

returns a real number in the range `0` to `x` (**not** inclusive of `x`).
Example: `RAND(87)` could return `35.430729`

**Date functions**
Date format is assumed to be DD/MM/YYYY unless otherwise stated

`DAY(ThisDate : DATE) RETURNS INTEGER`

returns the current day number from `ThisDate`
Example: `DAY(04/10/2003)` returns `4`

`MONTH(ThisDate : DATE) RETURNS INTEGER`

returns the current month number from `ThisDate`
Example: `MONTH(04/10/2003)` returns `10`

`YEAR(ThisDate : DATE) RETURNS INTEGER`

returns the current year number from `ThisDate`
Example: `YEAR(04/10/2003)` returns `2003`

`DAYINDEX(ThisDate : DATE) RETURNS INTEGER`

returns the day index number from `ThisDate` where Sunday = 1, Monday = 2 etc.
Example: `DAYINDEX(07/11/2023)` returns `3`

`SETDATE(Day, Month, Year : INTEGER) RETURNS DATE`

returns a value of type `DATE` with the value of `<Day>/<Month>/<Year>`
Example: `SETDATE(26, 10, 2003)` returns a date corresponding to 26/10/2003

`TODAY() RETURNS DATE`

returns a value of type `DATE` corresponding to the current date.

### Text file functions

| |
|---|
| `EOF(FileName : STRING) RETURNS BOOLEAN`<br><br>returns `TRUE` if there are no more lines to be read from file `FileName`<br>The function will generate an error if the file is not already open in `READ` mode. |

### Operators

An error will be generated if an operator is used with a value(s) of an incorrect type.

| | |
|---|---|
| `&` | concatenates (joins) two strings.<br>Example: `"Summer" & " " & "Pudding"` evaluates to `"Summer Pudding"`<br>may also be used to concatenate a `CHAR` with a `STRING` |
| `AND` | performs a logical `AND` on two Boolean values.<br>Example: `TRUE AND FALSE` evaluates to `FALSE` |
| `OR` | performs a logical `OR` on two Boolean values.<br>Example: `TRUE OR FALSE` evaluates to `TRUE` |
| `NOT` | performs a logical `NOT` on a Boolean value.<br>Example: `NOT TRUE` evaluates to `FALSE` |
| `MOD` | finds the remainder when one number is divided by another.<br>Example: `10 MOD 3` evaluates to `1` |
| `DIV` | finds the quotient when one number is divided by another.<br>Example `10 DIV 3` evaluates to `3` |

### Comparison operators

| | |
|---|---|
| `=`<br><br>`>`<br><br>`<`<br><br>`>=`<br><br>`<=`<br><br>`<>` | used to compare two items of the same type.<br>evaluates to `TRUE` if the condition is true, otherwise evaluates to `FALSE`<br><br>Notes:<br><br>• may be used to compare types `REAL` and `INTEGER`<br>• may be used to compare types `CHAR` and `STRING`<br>• case sensitive when used to compare types `CHAR` and / or `STRING`<br>• cannot be used to compare two records<br><br>Examples:<br><br>• `"Program" = "program"` evaluates to `FALSE`<br>• `Count = 4` evaluates to `TRUE` when `Count` contains the value `4` |

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