Cambridge Assessment International Education

Cambridge International AS & A Level

COMPUTER SCIENCE **9618/21**

Paper 2 Fundamental Problem-solving and Programming Skills **May/June 2023**

INSERT **2 hours**

1281968342-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.

This document has **4** pages.

© UCLES 2023

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 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 string `"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"`

`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 character `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)` may return `35.43`

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(09/05/2023)` 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` returns `TRUE` if there are no more lines to be read from file `FileName` 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 or values of an incorrect type.

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

Comparison Operators

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

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2023