CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

JUNE 2016 **ADVANCED LEVEL**

Subject Title	**Computer Science**
Paper No.	**Paper 3 – Practical Work**
Subject Code No.	**0795**

Three Hours

Carry out ALL the tasks given. For your guidance, the approximate mark for each part of a task is indicated in brackets.

Great importance is attached to the accuracy, layout and labelling of the drawings and computer generated outputs.

You are reminded of the necessity for good English and orderly presentation of your answers.

Write algorithms in the answer booklet provided. Also record in your answer booklet any information requested or that you believe would make it easier to understand how you carried out tasks or answered questions.

You are expected to print out a single copy of relevant fragments of your program at different times. ***Please notify the instructor of any required printout that was not done!***

When an imperative programming language is required to write program code, either **Standard [ISO]** Pascal or the **[ANSI]** C programming language may be used.

If need be, supervisors will assist you in recording details of intermediate work carried out on the computer.

Do not write on the first page of your answer booklet. It is reserved for administrative purposes.

Where information is provided as soft copy, notify the instructors if it is not found in your machine or has not been made available to you.

EXERCISE

You are expected to carry out practical activities on the computer using a DBMS of your choice and store the result as requested.

Task 1

The Library of a school has just been filled with new books. The library attendant has a major problem keeping track of the books in shelves and those on loan. A Reader in this college may have more than one book out on loan. Apart from the Reader ID (identity), a Reader may also have the following information of obvious meaning: surname, first name, title, address, town, sex, and a Book: book ID, title, Author, publisher and dateofpub (i.e. date of publication).

(a) In your answer booklet, describe these tables in terms of relation and attribute names. **(2 marks)**

(b) From the above tables we cannot say who has which book on loan. Some possibilities include: adding fields to table, Book or table, Reader, or creating a third table called Loan. Express the loan relation table as a table having only FOUR FIELDS, two of which are the date due and date taken fields. **(3 marks)**

(c) Create the table below using the DBMS software selected to complete the fields for Loan. Save and print a copy of each table. **(5 marks)**

READER				BOOK			LOAN		
Field	**Data type**	**Field size**	**Enumera-ted values**	**Field**	**Data type**	**Field size**	**Field**	**Data type**	**Field size**
ReaderID	Text	6		bookID	Text	6		Text	6
Surname	Text	20		Title	Text	20		Text	6
Firstname	Text	20		Author	Text	20		Date	Date
				Datepub	Date	Date		Date	Date
Sex	Text		F,M	Publisher	Text	20			

(d) Create an Entity-Relationship diagram for the three entities showing the correct cardinalities. Save and print a copy. **(3 marks)**

(e) Populate the tables with the following data. Save and print a copy of each table. **(8 marks)**

BOOK				
bookID	**title**	**author**	**dateofpub**	**publisher**
lib001	csc7	Naty	8/6/2013	neba printers
lib002	ict7	Naty	7/3/2013	neba printers
lib003	csc5	Tazi	4/6/2011	emengu
lib004	Advanced computing	Tazi	11/7/2012	emengu
lib005	Physical geo	Cinlair	4/10/2013	macmillan
lib006	Econs geo	Cinclair	8/7/2012	emengu
lib007	College maths	Mbong	2/9/2012	Anucam
lib008	Advance physics	Newton	10/13/2010	neba printers
lib009	principe of physics	Nfor	7/7/2013	two brothers
lib010	College Maths	Nabot	2/6/2013	Oxford

READER					
readerID	**surname**	**firstname**	**address**	**town**	**sex**
rd001	MATINES	Jones	bp20	Limbe	Male
rd002	MALET	Peters	po box 40	Limbe	Male
rd003	TEGHEN	Rose	bp45	Buea	Female
rd004	NGALA	Joan	bp67	Tiko	Female
rd005	TABA	Malam	bp30	Ndop	Male
rd006	TAFAC	Vincent	bp9	Nkwen	Male
rd007	NANFACK	geogia	bp70	bafousam	Female
rd008	NKEMKANG	john	bp80	bafousam	Male
rd009	KAHMBANG	joshua	bp09	Tiko	Male
rd010	ABINI	beatrice	bp76	batibo	Female

LOAN			
bookID	**readerID**	**datetaken**	**datedue**
lib001	rd001	5/9/2013	10/9/2013
lib003	rd005	8/6/2012	1/3/2013
lib004	rd001	5/9/2013	9/9/2013
lib002	rd002	8/8/2013	9/10/2013
lib006	rd004	7/7/2012	10/8/2013
lib005	rd004	2/5/2013	8/6/2013
lib008	rd010	9/10/2013	10/15/2013

(f) Create a query for each of the following, save and print a copy:

- books on loan, using only BookID, title, author and date taken.
- list of female readers who have at least loaned a book using only ReaderID, surname, firstname, town, sex, book title and date taken.
- list of books which have been taken at least once and whose date of publication is before January 2013.

(3 marks)

Task 2

1. An English language teacher recorded the scores of a test which he sorted (i.e. in ascending or descending order). He knows that you are a Computer Science student so he asks you to use the sorting algorithm (given in pseudocode) below to help him order his marks.

```
Start:
n, table[1000], c, d, t; integers

Enter the number of elements
to be sorted n
Enter n integers

for c = 0 to c
 less than n do
   read the table
endfor

 for c = 1 to c less than n-1 do
  d = c;

 while d is different from 0 and table[d] is
  less than table[d-1] do
 t = table[d];
table[d] = table[d-1];
table[d-1] = t;

decrease d;

/*output a list  Sorted in ascending order*/
for c = 0 to c less than or
equal to n
endfor
print(table[c])
 return 0;
end
```

(a) In your answer booklet name the sorting algorithm used. **(1 mark)**

(b) Transform the algorithm into a program to sort elements in an array. Make sure the program works. **(10 marks)**

(c) Run the program using 10 as the number of marks record. **(2 marks)**

(d) Save a copy of your output, and print it. **(1 mark)**

(e) Modify the program to sort in descending order. Save and print a copy of the program. **(2 marks)**

(f) Run the program and use 10 as the number of marks to record. Save and print a copy of your output. **(2 marks)**

Task 3

(a) In your answer booklet, write a recursive algorithm to calculate the factorial function of a given number. **(2 marks)**

(b) Implement the above algorithm in C or Pascal using a recursive function. **(3 marks)**

(c) Save and print a copy of your program. **(2 marks)**

(d) Use 5 and 7 as test data to run the program, and print its output. **(1 mark)**

THE END