

COMPUTER SCIENCE

016

15/11/2016 8.30am- 11.30am



ADAVANCED LEVEL NATIONAL EXAMINATIONS, 2016

SUBJECT: COMPUTER SCIENCE

COMBINATIONS:

- **MATHS-COMPUTER SCIENCE-ECONOMICS: MCE**
- **MATHS-PHYSICS-COMPUTER SCIENCE: MPC**

DURATION: 3HOURS

INSTRUCTIONS:

1. Do not open this question paper until you are told to do so.
2. Write your name and index number on the answer booklet as written on your registration form.
3. This paper consists of **three** sections: **A, B** and **C**.

Section A: Attempt **all** questions.

(55marks)

Section B: Attempt **three** questions.

(30marks)

Section C: Attempt **any one** question.

(15marks)

4. Use only **blue** or **black** pen.

SECTION A: Attempt all questions in this section. (55 marks)

- 1) Complete the following result of a relational operation which is a Boolean value that can only be true or false, according to its Boolean result. (5marks)
- If $a=2, b=3, c=6$
($a == 5$)
($a*b \geq c$)
($b+4 > a*c$)
($(b=2) == a$)
($c > b$)
- 2) Consider the following declaration: (2marks)
- (i) short i=10;
(ii) static i=10;
(iii) unsigned i=10;
(iv) const i=10;
- Choose the correct answer:
- a) Only (iv) is incorrect
b) Only (ii) and (iv) are incorrect
c) Only (ii), (iii) and (iv) are correct
d) Only (iii) is correct
e) All are correct declarations
- 3) What are the functions of a hard drive? (2marks)
- 4) What are the functions of the following? (4marks)
- (a) Antivirus Program (b) Spyware Remover
(c) Firewall (d) NIC
- 5) What are the four main roles of operating systems? (4marks)
- 6) What is a control in VB? Give three of its examples. (5marks)
- 7) What are the differences between a form module and standard module? (2marks)
- 8) Write an algorithm which receives water temperature and displays the states of water as follows: (5marks)
- Below 0 : state is Solid
Below 100 : state is Liquid
100 and above : state is Gas.
- 9) What are the 6 common services provided by operating systems? 6marks)
- 10) What are the differences between a function call and a system call operating system? (3marks)
- 11) What is a block of statement? (2marks)
- 12) What are the outputs of the following program? (4marks)
- #include <stdio.h>main()
{inti = 10;
while (i > 0)

```

{printf("Hello %d\n", i);
i = i - 1;
if(i == 6 )
{
break; }
}}

```

13) What are the outputs of the following program?

(4marks)

```

#include <iostream>
using namespace std;
int subtraction (int a, int b)
{
int r;
r=a-b;
return (r);
}
int main ()
{
int x=5, y=3, z;
z = subtraction (7,2);
cout<< "The first result is " << z << '\n';
cout<< "The second result is " << subtraction (7,2) << '\n';
cout<< "The third result is " << subtraction (x,y) << '\n';
z= 4 + subtraction (x,y);
cout<< "The fourth result is " << z << '\n';return 0 }

```

14) Give four examples of DBMS languages.

(4marks)

15) Distinguish data integrity from data security.

(3marks)

SECTION B: Attempt any three questions (30 marks)

16) a)What is a computer?

(2marks)

b) Describe the four main categories of computers.

(8marks)

17) a)Define the following networking devices:

(5marks)

- (i) Router (ii) Gateway (iii) Bridge
(iv) Hub (v) Repeater

b) Complete the following table which are IP address classes and subnetmasks.

(5marks)

Class	First Octet – to	Default Subnet Mask	Number of Networks
A			
B	128 to 191		16,384
C	192 to 223		2,097,152

- 18) Write a program in C++ containing two functions that return values.
The first Function returns the higher of two numbers entered by the user. The second Function returns the lowest number.
The parameters for the two functions are entered through the main function. **(10marks)**

- 19) Write an algorithm and the flowchart for the problem that allows the user to input three numbers and display the sum, the average and their product.

Flowchart:

(10marks)

- 20) Write SQL commands on the basis of EMPLOYEES table given below:

EMPLOYEES						
Emplo ye e No.	Firstname	Lastname	DeptNo	Jobs	Salary (Frw)	Comm sion (Frw)
1	Hakizimana	Moses	10	manager	300,000	25,000
2	Harindintwari	J claud	10	driver	100,000	5,000
3	Mukakimenyi	Vanessa	15	president	750,000	00
4	Mutimukeye	Sandrine	15	clerk	150,000	00
5	Uwambajimana	Hackimu	12	driver	120,000	00
6	Kalisa	Eric	12	analysis	350,000	10,000
7	Harimpisya	Edson	10	clerk	180,000	7,000
8	Tumwebaze	Hamisi	15	security	800'000	00
9	Mutoni	Sandrine	15	manager	280,000	15,000
10	Umuhoza	Yvonne	10	reception	110,000	1,000
11	Tumusifu	Emmanuel	12	analysis	400,000	5,000

- a) To show total salary for manager's Job and rename salary as managers' salary. **(2marks)**
- b) Find all Employees whose Department is the same as that of "Tumusifu" **(1mark)**
- c) Display First name, last name, Job, Commission and Increase the Commission of all Employees by 10%. **(2marks)**
- d) Count the available Employees in the table. **(1mark)**
- e) Show by Names and the Commission for the Employees who receive the commission (Frw) of 1000,5000 and 00 respectively. **(2marks)**
- f) Display all Employees that do not receive any Commissions. **(2marks)**

SECTION C: Attempt only one question (15marks)

- 21) a) Define "Concurrency in SQL". **(3marks)**
b) List and explain 6 constraints in SQL. **(12marks)**
- 22) Write a VB program to find Fibonacci series up to a given term (useInputBox). **(15marks)**