# Computer Science

# 016

**17/11/2015    8.30- 11.30 AM**

**REB**

**Rwanda Education Board**
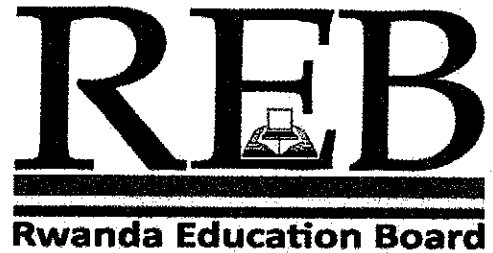
**ADAVANCED LEVEL NATIONAL EXAMINATIONS, 2015**

**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. 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)**

3. Use Blue or black pen

## SECTION A: ATTEMPT ALL QUESTIONS. (55 MARKS)

1) Which controls have refresh method in VB 6? **(4marks)**

2) Write an algorithm which receives a number and informs the user
   when it is negative. **(4marks)**

3) Which of the following are hardware and software? **(2marks)**
   (a) Capacitor
   (b) Internet Explorer
   (c) Hard disk
   (d) UNIX

4) What are the DBMS languages? Explain with examples. **(4marks)**

5) What is a *flowchart?* **(3marks)**

6) What is domain name system (DNS)? **(3marks)**

7) In a network that contains two servers and twenty workstations,
   where is the best place to install an Anti-virus program?  Explain why. **(3marks)**

8) (a)What are data types? **(2marks)**
   (b)What are all the predefined data types in c++? **(2marks)**

9) What will be the output of the following program segment? **(4marks)**
   If input is as: (a) g, (b) b, (c) e, (d) p
   ```
   cin>>ch;
   switch (ch)
   {
   case 'g': cout<<"Good";
   case 'b': cout<<"Bad";
   break;
   case 'e': cout<<" excellent ";
   break;
   default: cout<<" wrong choice";
   }
   ```

10) A hard disk is divided into tracks which are further subdivided into: **(1mark)**
    (a) Clusters
    (b) Sectors
    (c) Vectors
    (d) Heads
    (e) None of the above

11) (a) What is the role of union in SQL? *Under* *Analy* **(3marks)**

(b) What is the difference between DELETE and DROP SQL statement?

**(3marks)**

12) Using suitable examples, explain how you can give comments *Know*
in C program.

**(4marks)**

13) What are the 4 disadvantages of data base management system? *Know* **(4marks)**

14) Write C program to accept a string and find out total numbers of *Creat Synt*
characters.

**(5marks)**

15) Distinguish the Private members from Protected members. *Analyse* **(4marks)**


## SECTION B: ATTEMPT ANY THREE QUESTIONS. (30 MARKS)

16) (a) Define the terms: entity, attribute and relationship between *Know*

the entities, giving examples for each of them. **(6marks)**

(b) What are the differences between database normalization and *Analyse*

database de-normalization? *Creat* **(4marks)**
*Synte*

17) Write a C++ program to print the following pattern. **(10marks)**

```
   *
  ***
 *****
******
********
```

18) Distinguish the features of fourth generation from features of first *Understt*

generation computers. **(10marks)**

19) Define a class Applicant in C++ with following description *Appli* **(10marks)**

**Private Members**

☐ A data member ANo (Admission Number) of type long

☐ A data member Name of type string

☐ A data member Agg (Aggregate Marks) of type float

☐ A data member Grade of type char

⬜ A member function GradeMe() to find the Grade as per the Aggregate Marks obtained by a student. Equivalent Aggregate Marks range and the respective Grades are shown as follows:

Aggregate Marks Grade

>=80 A

less than 80 and >=65 B

less than 65 and >=50 C

less than 50 D

## Public Members

⬜ A function ENTER() to allow user to enter values for ANo, Name, Agg and call function GradeMe() to find the Grade.

⬜ A function RESULT() to allow the user to view the content of all the data members.

20) In a company an employee is paid as: Appli **(10marks)**

If his basic salary is less than 15,000Frw, then

HRA=10% of basic salary

TA=90% of basic salary

If his salary is either equal to or above 15,000Frw, then

HRA= 500Frw

TA=95% of basic salary. If the employee's basic salary is input through the keyboard write a visual basic program to display his gross salary, TA and

HRA in the text box EX:

BASIC SALARY   50000

TA   47500

HRA   500

GROSS SALARY   98000

COMPUTE

## SECTION C:  ATTEMPT ONLY ONE QUESTION. (15 MARKS)

21) Complete the following table which is binary number representation. *Lindey*

**(5marks)**

|    | B3 | B2 | B1 | B0 |
|----|----|----|----|----|
| 3  | 0  | 0  | 1  | 1  |
| 4  |    |    |    |    |
| 5  |    |    |    |    |
| 6  |    |    |    |    |
| 7  |    |    |    |    |
| 8  |    |    |    |    |
| 9  |    |    |    |    |
| 10 |    |    |    |    |
| 11 |    |    |    |    |
| 12 |    |    |    |    |
| 13 |    |    |    |    |

(a) Find decimal equivalent of $(1200.011)8 = (?)10$. **(2marks)**

(b) Subtract $(11110.1101)2$ from $(111111.1111)2$. **(2marks)**

(c) Find binary equivalent of $(251.35)10 = (?)2$. **(2marks)**

(d) Find decimal equivalent of $(14AC)_{16} = (?)10$. **(2marks)**

(e) Find decimal equivalent of $(123A)_{16} = (?)10$. **(2marks)**

22) **Consider the following tables EMPLOYEE and SALGRADE and answer the questions that follow :**

*App -*

**Table: EMPLOYEE**

| ECODE | NAME | DESIG | SGRADE | DOJ | DOB |
|-------|------|-------|--------|-----|-----|
| 101 | KAREKEZI Ange | EXECUTIVE | S03 | 23-Mar-2003 | 13-Jan-1980 |
| 102 | GANZA Kevin | HEAD - IT | S02 | 12-Feb 2010 | 22-Jul-1987 |
| 103 | MUTONI Rehma | RECEPTIONIST | S03 | 24-June-2009 | 24-Feb-1983 |
| 105 | NKUSI Anicet | MANANEGER | S02 | 11-Aug-2006 | 03-Mar-1984 |
| 108 | KARENZI Abdul | CEO | S01 | 29-Dec-2004 | 19-Jan-1982 |

**Table: SALGRADE**

| SGRADE | SALARY | HRA |
|--------|--------|-------|
| S01 | 56000 | 18000 |
| S02 | 32000 | 12000 |
| S03 | 24000 | 8000 |

Write SQL commands for the following statements:

I. To display the details of all EMPLOYEES, in descending order of DOJ.

**(2marks)**

II. To display NAME and DESIG of those EMPLOYEEs, whose

SALGRADE are either S02 or S03. **(2marks)**

III. To display the content of all the EMPLOYEEs table, whose DOJ

are in between'09- Feb-2006' and '08-Aug-2009'. **(2marks)**

IV. To add a new row with the following:

109, 'Harish Roy', 'HEAD-IT', 'S02', '09-Sep-2007, '21-Apr-1983' **(2marks)**

V. Give the output of the following SQL queries:

(a) SELECT COUNT(SGRADE) AS CODE, SGRADE FROM

EMPLOYEE GROUP BY SGRADE; **(2marks)**

(b) SELECT MIN(DOB) AS MIN, MAX(DOJ) AS MAXDOB FROM

EMPLOYEE; **(2marks)**

(c)SELECT SGRADE, SALARY+HRA FROM SALGRADE WHERE

SGRADE= 'S02'; **(1 mark)**

(d)SELECT SGRADE, (SALARY+HRA)*5/100 FROM SALGRADE

WHERE SGRADE='S02'; **(1mark)**

(e) SELECT NAME,SALARY FROM EMPLOYEE E, SALGRADE S

WHERE E.SGRADE= S.SGRADE AND E.ECODE<103; **(1mark)**