

**UNIVERSITY OF SWAZILAND  
FINAL EXAMINATION MAY, 2013 (SEM-II)**

**Title of the Paper :** STRUCTURED PROGRAMMING - II

**Course Number :** CS244

**Time Allowed :** Three (3) Hours

**Instructions:** Submit pseudo code on the answer script and all your files (program, data, report and any other) in the root directory of your **Examination userid**. The **Examination userid, password, tree, context and server** will be given to you by the chief invigilator. Include all file specifications in your F:\ on the top of the answer script. This exam has pages from 1 to 3.

Use the last 10 minutes to check the submitted files and print the program and report files. Submit answer script, the signed printed copy of your program and report files.

Read the paper completely before starting to work on the problem.

The names of program and report files should be –

----- .cpp (Program file) and  
----- .TXT (Result file)

The dashes in file names are six digits of your UNISWA id.

**Special requirements: For each student**

- 1. A networked PC with working C++ system.**
- 2. An accessible secure network disk (F:\) & Printing facility.**

This paper should not be opened until permission has been granted by the invigilator.

**MARKING SCHEME:** Pseudo code (30 %), Results (20 %), Program (50 %)

**PROBLEM:** Information about physical measurements of students in a class is given in a text file 'F:\2013.TXT'. Each record of this file has the following -

Surname & Initials	15 characters (separated by a space)
Gender	1 character ('M' for Male and 'F' for Female)
Id	6 digits - long integer
Weight	3 digits (in Pounds) – integer
Height	3 digits before decimal and 1 digit after decimal (in Inches) – floating / double
Age	2 digits (in years) – integer

Each of the above fields has been separated by a space character and Id in sentinel record is zero. Example of a record -

```
DLAMINI L.A.      M 120786 124 065.2 25
      1           2           3           4
12345678901234567890123456789012345678901 {ARE COLUMN NOS}
```

Write pseudocode and a corresponding well documented and properly indented program in C++ that does the following –

1. Read in the data from 'F:\2013.TXT'.
2. Compute Basic Metabolic Ratio (BMR) for each student and displays the information on a report file ("F:\----- .TXT") with summary .
3. The six dashes in the report file name are six digits of your id number.
4. The BMR is  $(BM + 1000)/100$  and BM is computed as follows –

For male students –

$$BM = 66 + (6.3 \times \text{weight}) + (12.9 \times \text{height}) - (6.8 \times \text{age})$$

For female students --

$$BM = 65.5 + (4.3 \times \text{weight}) + (8.7 \times \text{height}) - (4.7 \times \text{age})$$

5. Write and use a function to compute BMR with gender, weight, height and age as formal parameters.

6. The contents of "F:\2013.TXT" are -

```

DLAMINI L.A.      M 120786 124 065.2 25
SHONGWE P.D.     F 120785 145 068.5 18
BENNET T.S.      F 120786 137 060.6 20
THWALA D.M.      M 120251 204 070.2 18
BEATRIC S.P.     F 120786 174 065.5 21
DVUBA M.         M 120197 205 069.1 28
SIBISI J.N.      M 120630 180 070.6 23
VILAKATI K.      F 120246 170 071.2 21
SISA D.M.        M 120240 160 064.8 30
SENTINEL DATA   M 000000 000 000.0 00
  
```

The report lay out should be -

REPORT PRODUCED BY THE PROGRAM OF

<YOUR ID>

BMR REPORT FOR CS244 (2012 / 2013)  
Computer Science Department

```

=====
ID      NAME                GENDER WT   HT   AGE BMR
=====
-----
-----
-----
-----
  
```

...

SUMMARY

```

=====
COUNT OF STUDENTS      =  --
COUNT OF MALE STUDENTS =  --
COUNT OF FEMALE STUDENTS =  --
AVERAGE BMR OF MALE    =  -----.--
AVERAGE BMR OF FEMALE  =  -----.--
  
```

<END OF EXAMINATION PAPER>