

**UNIVERSITY OF SWAZILAND
FINAL MAIN EXAMINATION DEC 2016, (SEM-I)**

Title of the Paper : STRUCTURED PROGRAMMING – II /
COMPUTER PROGRAMMING - II
Course Number : CS244 / CSC213
Time Allowed : Three (3) Hours

Instructions: This exam has pages from 1 to 3. The **Examination userid, password, tree, context and server name** will be provided by the chief invigilator.

1. Write file specifications of all the files in the root of your network drive F:\ in your folder at the end of examination.
2. Submit folder with pseudo codes, signed listings of programs and report files.
3. Use the last 10 minutes to print / check the submissions (file specifications, pseudo codes, signed listings of your programs and report files)

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

The names of program and report files should be –

----- .cpp (Program file) and
----- .TXT (Report 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 %), Program (50 %), Report file (20 %)

PROBLEM: Information about physical measurements of students and exercise activity levels in a class is given in a text file 'F:\MDAT2016.TXT'. Each record of this file has the following -

Name	15 characters
Gender	1 character ('M' for Male and 'F' for Female)
Id	6 digits - long integer
Weight	3 digits (in Kilos) – integer
Height	3 digits (in Cms) – integer
Age	2 digits (in Years) – integer
Activity level	1 digit – integer (from 1 to 5)

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

DLAMINI M 120786 065 170 25 2

Write complete pseudo code and corresponding well documented and properly indented programs in C++ that do the following –

1. Reads a student data from the file 'F:\MDAT2016.TXT'.
2. Compute Basal Metabolic Rate (BMR) and daily Calorie needs for each student and display 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 Body Mass Ratio (BMR) is computed in a function using gender, weight, height and age as formal parameters –

For male students –

$$\text{BMR} = 66 + (13.7 \times \text{weight in kilos}) + (5 \times \text{height in cm}) - (6.8 \times \text{age in years})$$

For female students –

$$\text{BMR} = 65 + (12.8 \times \text{weight in kilos}) + (5.4 \times \text{height in cm}) - (6.7 \times \text{age in years})$$

5. Daily calorie intake are computed by multiplying the factor and BMR. The five activity levels and corresponding factors are –

Activity	level	factor
Insignificant	1	1.2
Light	2	1.375
Moderate	3	1.55
Active	4	1.725
Exceptional	5	1.9

6. The contents of 'F:\MDAT2016.TXT' are -

```
DLAMINI      M 120786 065 170 25 2
SHONGWE     F 120785 070 173 18 1
BENNET      F 120783 060 137 20 4
THWALA      M 120251 070 204 22 1
BEATRIC     F 120786 065 159 21 5
DVUBA       M 120197 070 175 28 3
SIBISI      M 120630 080 180 23 2
VILAKATI    F 120246 079 171 21 4
SISA        M 120240 064 194 30 3
SENTINEL    ? 000000 000 000 00 0
```

The report lay out should be --

REPORT PRODUCED BY THE PROGRAM OF

<YOUR ID>

BMR / CALORIES REPORT FOR YOUNG CLUB PLAYERS (2016/2017)
MATSAPHA, SWAZILAND

```
=====
ID      NAME                GENDER WT   HT   AGE BMR      CALORIE
                               INTAKE
=====
-----
-----
-----
...
=====
```

SUMMARY
=====

```
COUNT OF PLAYERS           =  --
COUNT OF MALE PLAYERS    =  --
COUNT OF FEMALE PLAYERS  =  --

AVERAGE BMR OF MALE      =  -----.-
AVERAGE CALORIE INTAKE OF MALE =  -----.-

AVERAGE BMR OF FEMALE    =  -----.-
AVERAGE CALORIE INTAKE OF FEMALE =  -----.-
```

<END OF EXAMINATION PAPER>