

UNIVERSITY OF SWAZILAND
FINAL EXAMINATION SEM-II, MAY, 2011

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, results 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 root on the top of the answer script.

Use the last 10 minutes to check the submitted files and print the program and report files. Submit 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 result files should be –

----- .PAS (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 Turbo Pascal system.
2. An accessible secure network disk.

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

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

PROBLEM: Information about physical measurements of students and exercise activity levels in a class is given in a text file 'F:\2011.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 L.A. M 120786 065 170 25 2

 1 2 3 4
12345678901234567890123456789012345678901 {ARE COLUMN NOS}

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

1. Read in the data from the file 'F:\2011.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 BMR is computed by using weight, height and age parameters as follows –

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 –

$$\text{BMR} = 655 + (9.6 \times \text{weight in kilos}) + (1.8 \times \text{height in cm}) - (4.7 \times \text{age in years})$$

Daily calorie needs 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

5. Use a subprogram (function or procedure) to compute BMR with gender, weight, height and age data values as formal parameters.

6. The contents of 'F:\2011.TXT' are -

```

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

```

The report lay out should be --

```

REPORT PRODUCED BY THE PROGRAM OF
<YOUR ID>

```

BMR / CALORIES REPORT FOR CS244 (2010/2011)
Computer Science Department, UNISWA

```

=====
ID      NAME                GENDER WT   HT   AGE BMR      CALORIES
=====
-----
-----
-----
...
=====

```

SUMMARY
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```

COUNT OF STUDENTS           =  --

COUNT OF MALE STUDENTS     =  --
COUNT OF FEMALE STUDENTS   =  --

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

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

```

<END OF EXAMINATION PAPER>