Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
End Semester Examination September/October 2013
CST 321-3 System Level Programming

Uva Wellassa University

Time Duration : Three Hours (03 hrs.)
Number of Pages : Two (02)

PART - B

Instructions to Candidates

1. **Open book** – Internet facility will not be provided.
2. Upload a single compressed file to the CMS. You **must name** it as your index number.
3. You **must add** your registration number and name, as comments for each and every source files.
4. You are **not allowed** to use any external memory devices during the exam.
5. If you **try to share your codes** with your colleagues in any manner, you will be disqualified from the exam.

1. Shell Scripting (40 mark)

The subject, Structured Programming Fundamentals is followed by the 09 and 10 batches of Computer Science and Technology (CST) degree program and Industrial Information Technology (IIT) degree program. The lecturer has given an in-class assignment and the students uploaded their answers to a same directory in a server remotely.

Your task: write a shell script to separate the answer scripts of CST/09, CST/10, IIT/09 and IIT/10 **using UNIX commands**. Download Resources.tar.bz2 file from the CMS to your home directory and follow the steps given below.

1. Uncompress Resurces.tar.bz2 file.
2. Change current working directory from home to Resources.
3. You must separate CST and IIT answer files available in Resources.
    a. Create two directories, CST and IIT inside Resources.
    b. Copy all the answer scripts of CST students to CST directory and answer scripts of IIT students to IIT directory.
4. You must distinct the answers of 09 and 10 batch separately.
    a. Create two directories 09 and 10 as the name of the directories inside CST and IIT separately.
    b. Move all the answer scripts to the corresponding directories (Ex: answers of CST 10 batch should move to the /Resources/CST/10).
5. Compress Resources directory with the file name Final_Resources.tar.gz

48

Finally you need to create a log file for future references inside the home directory considering th following format (YourName_answerbk.log should be the name of the log file). Fill the blanks wit suitable values/terms using **UNIX commands.**

```
########################
# This is YourName's log file
########################

The script was run by _____on the ____ at _____.
The Operating system : _____
The working directory : _____
Shell name           : _____

The first 10 lines of the compressed file is:
.....
.....
```

2. C Programming

a. Write three programs to find the largest element, smallest element and an average of given set numbers using dynamic memory allocation. You need to write separate functions for each tas Your programs should accomplish following features.

i. Ask user to enter the total number of elements (between 1 and 100).

ii. If no memory is allocated, display an error message and then the program should terminat

(20 mark)

b. Assume that your global variables are declared in a structure called **'data'**. Use separate head files to hold the function prototypes mentioned in **part a.** and the structure definition.

(10 mark)

c. Using your header files and source file created in **part a.** and **part b.** write a program to find

i. The largest and smallest elements (first.c)

ii. The largest element, smallest element and the average (second.c) **(10 mark)**

d. Write a **Makefile** to compile all the source codes you created in **part a., part b.** and **part c.** w the following features.

i. Debugging feature for all the executable files.

ii. Use macros to specify the compiler type, libraries, include files, object files, source fi and header files.

iii. Create two executable files **first** and **second** for first.c and second.c source files.

iv. Clean all the temporary files and object files.

v. Create a compressed file **final.tar** by including your Makefile, source files and header fi and executable files. **(20 mark)**