

## Programming for Communications and Networks

### Assignment 1 preparation

These questions are intended to help you evaluate your preparation for the knowledge test scheduled as assessment 1 for the Programming for Communications and Networks module. If you obtain anyone else's help to complete these exercises this stops you from being able to evaluate your own knowledge or improve it in any way that is likely to help you pass, so please don't. If you don't understand the questions, spending the time needed to figure them out for yourself is much better than failing the test. You are welcome to test your answers using the computer. During the real test you will not be able to do this - and the time available will be one hour. So it is best to attempt to answer every question as well as you can in a few minutes and not spend too long on any one question.

**Q1.** Write down the names of commands which have the following purposes: **5 marks**

- a. Copying a file
- b. Listing a directory
- c. Displaying the path of the current working directory
- d. Changing the current working directory
- e. Changing ownership of a file on the system

**Q2.** Write down a command pipeline including use of the ps and wc commands with appropriate flags, which counts the number of processes running on the system. **5 marks**

**Q3.** Write down one or more chmod commands which set the read/write/execute permissions on the file f1 to the following as displayed using ls -l f1 : -rwxr-x--- **5 marks**

**Q4.** a. Write the command you would use to display information from which you could obtain the identity and name of the parent process of a shell script called `your_menu` which you have written and which is currently running . **2 marks**

b. How would you would read the information displayed by this command to obtain this value ?  
**3 marks**

**Q5.** a. How would you check the current value of the `$PATH` environment variable ? **2 marks**

b. How would you add the working directory `“.”` to this environment variable so that programs in the working directory can be executed without needing to put `./` in front of their names ? **3 marks**

**Q6.** Write a pipelined command making use of `grep` and `awk` to print out the UID (numeric userid which is in the 3rd column) of the userid `peter` in the file `/etc/passwd`. This file is column delimited using colons `“:”`, and the userid is the first column. **10 marks**

**Q7.** Write a shell script which checks if the file `book.txt` exists and is readable. If it is readable your script outputs the numbers of times each of the 4 following words are used: *and, or, if, then* in `book.txt` . Your script must also output the total of these 4 numbers. If the file is not readable, the script should output an error message. **25 marks**

**Q8. a.** Explain briefly the purpose of the fork() system call. **10 marks**

b. Give an example of a Linux program which makes use of fork() and explain why it uses fork().  
**10 marks**

**Q9 a.** How do you run a command in background ? Give an example. **5 marks**

b. How do you make an interactive program running in foreground stop running without it ending ?  
**5 marks.**

c. How do you cause a program stopped from running to continue running in background ? **5 marks**

d. How do you cause a program running in background to go into foreground ? **5 marks**