Loughborough University

Essential Skills for Computing
09COA101

This exam consists of 7 questions giving a total of 100 marks. You should attempt to answer every question.

Calculators are not permitted.

(The marks associated with each question give an indication of the relative importance of its sections. Examiners may make minor redistributions within a question if necessary.)

Write your Student ID number here: _____

Write your Seat Number here: _____

- Write your answers directly onto this examination paper.

- Write your answers in pencil so you can fully erase mistakes,

- Remember to write your id number and seat number above and at the top of each subsequent page.

Questions start over the page.
Please do not turn the page
until you are instructed to do so.

1. [20 points] -

    (a) Consider the table below, which gives a number of typographical tasks and a set of packages to implement these in. Where there is a Roman Numeral in the cell write under the table the mechanism to achieve that task in that package:

Item	LaTeX	HTML	Word
Emphasis with italics and bold		i	
Bulleted Lists			
Numbered Lists			
Main Headings	ii	iii	iv
To produce a Table of Contents			
To make a cross Reference to a Page number			
To make a cross Reference to a Figure			

i. _____

_____

ii. _____

_____

iii. _____

_____

iv. _____

_____

(b)   i. Which Character Set has the encoding UTF-8 ?

_____

     ii. A new style called **code** is defined in MS Word. This style will be used to document snippets of code such as HTML and PHP. What property should the font selected for the style **code** have ?

_____

     iii. The following CSS appears in the header section of a web page:

```
<style type="text/css">
p.mypara{background-color:#99EEAA;}
</style>
```

Complete the following so that the CSS styling is applied to the paragraph.

```
<p                >This paragraph has a background colour</p>
```

2. [20 points] In LaTeX the `\frac` command provides a fraction with the two parameters being the numerator and the denominator, respectively. In addition the following commands produce the respective symbols:

LaTeX	Output
`\infty`	∞
`\copyright`	©
`\sqrt{aa}`	$\sqrt{aa}$
`\pm`	$\pm$
`\sum_{i=0}^{n}x_i`	$\sum_{i=0}^{n} x_i$
`\lim_{x\rightarrow 0}`	$\lim_{x \to 0}$
`\pi`	π

Which LaTeX commands would be needed to typeset the following:

$\sqrt{z}$	
$A = 2\pi r$	
$e^{i\pi} + 1 = 0$	
$\lim_{x\to\infty} \dfrac{1}{x} = 0$	

Continued ...

3. [10 points] In regular expressions the following are special characters with their meanings:

Character	Meaning
.	Match any character
*	Match zero or more occurrences of the previous character
?	Match zero or one occurrence of the previous character
[] e.g. [abc]	Match any character between the brackets
[a-z]	Match any character in the range a-z
^	Match beginning of line or string
$	Match end of line or string

Halls is a large Company with many products and as such has a unique product code for each product. Each product code consists of exactly 6 characters. The first character is an uppercase letter. The remaining 5 characters can be any mix of digits and letters (uppercase or lowercase). Give the regular expressions that will satisfy the following criteria.

[for example: the regular expression ^C will match with any product code that begins with the character C]

(a) Any product code that has at least two occurrences of the character T in it

_____

(b) Any product code that has b as the last character

_____

(c) Any product code that has B or C as the first character and 6 or 8 as the fourth character.

_____

4. [10 points] Consider a directory containing three files. `ls -l` provides the following listing:

```
-rw-r--r--  1 iain   staff    6 27 Nov 18:27 one
-rw-------  1 iain   staff   16 27 Nov 18:27 two
-rw-r-----  1 iain   staff    6 27 Nov 18:27 three
```

On the system there are users called `iain`, `bill` and `andre`. The group `staff` contains only users `iain` and `andre`.

(a) Which file, if any, can only `iain` read?

_____

(b) What `chmod` command would remove all access to everyone on the system except `iain` to file `one`.

_____

(c) Which of the two files *are most likely* to give the same output to the `md5sum` command? Explain your answer.

_____

_____

_____

_____

(d) You now need to create a folder called `sub` containing two files `aaa` and `bbb`. `bill` should be able to read `aaa` only. `andre` and `iain` should be able to read and write `aaa` and `bbb`. What commands would be needed to create this structure. Note that the default permissions on the folder should not be assumed. You may use the `touch` command to create the files.

_____

_____

_____

5. [15 points] Halls is a large company with several subsidiaries: Halls Engines, Halls Trac-
   tors, Halls Trucks ...etc... For each subsidiary there is a single file that contains employee
   information. The filename is the name of the subsidiary. Each record in the files contains
   3 fields: family name, given name, salary. The subsidiary files are contained in the single
   directory Halls.
   The following is an extract from the file `Halls Engines`:

   ```
   Brown,John,24000
   Brown,Susan,26000
   Smith,Jill,24000
   ```

   (a) Complete the following awk command so that it will print all records from the file
       `Halls Engines` where the Family Name is `Brown`.

       ```
       awk -F    '           /        /{        }'
       ```

   (b) Complete the following Script so that, for each subsidiary:
       - print an initial line containing subsidiary name and family name
       - prints the given name and salary of all those with the specified family name.

       The family name and the directory name are passed to the Script as parameters

       ```
       #
       # Script Name =
       # parameter 1 = family name
       # parameter 2 = name of directory containing the subsidiaries data files
       #

       cd

       for filename in
       do

       echo "Subsidiary =          Family Name =          "

       awk -F    '    /    /{print     " has a salary of "        }'

       done
       ```

   (c) The Script, above, will output the results to the screen. Give the Command Line that
       will execute this Script and redirect the results to file `saved-results`.

6. [10 points] This question tests your knowledge of the `grep`, `head` and `tail` commands.

   (a) Which `grep` option provides the lines that *don't* match the specified regular expression?

   _____

   (b) What command and options would you use to find the last 9 lines of a file?

   _____

   (c) What pipeline would allow you to print only lines 3–5 from a 10-line file.

   _____

   (d) A computer writes status messages as single lines appended to the end of a log file called `syslog`. The first part of each line is name of the program that created the message followed by a colon. What command would you use to find the last four messages generated by a program named `updater`?

   _____

7. [15 points] When producing academic reports it is perfectly acceptable to include the work of others. It is, though, essential that one makes it obvious that such included material is the work of others otherwise one could be accused of plagiarism. Explain, for each of the following, how you would include and reference others' work. Give your answers in the form of mocked up examples ie create a paragraph with a citation and for (b) and (c) put in a mock reference:

(a) Verbal Quotes

_____

_____

_____

_____

(b) Websites (Use the Numeric referencing method)

_____

_____

_____

_____

References

_____

_____

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(c) Academic Papers (Use the Harvard referencing method)

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References

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Dr I. W. Phillips
A. Schappo