University of Swaziland

Faculty of Science
Department of Computer Science

Final Examination, 2006/07

Title of Paper: Computer Organisation II

Course Number: CS341

Time Allowed: Three (3) hours

Instruction: Answer all questions. Questions carry equal marks.

You are reminded that in assessing your work, account will be taken of the accuracy of the material, of the language used and the general quality of expression, together with the layout and presentation of your answer. Remember full answers will usually *define, explain and exemplify*.

Special Requirement:

Calculators are prohibited.

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

Question 1.
a) Evaluate the following arithmetic expression into decimal:

$$123_{16} + 123_{10} - 123_8$$

b) Evaluate the following reverse polish expression, where each number is a (decimal) digit:

abcde*f/+g-h/*+

c) Convert into reverse polish the following infix expression (where, of course, operators have their usual precedence):

(a-b)*(((c-d*e)/f)/g)*h

d) You use a Unix operating system as:

username: chipo
group: moyo

Another user is:

username: dlamini
groups: dlamini, moyo

You have a file *kudla.gif* that you wish dlamini to read and, for some reason, execute. You must be able to write and read the file. No-one else is to have access.

Give the relevant parts of the *ls -l kudla.gif* output.

e) What do the following commands do?
        i) pwd
        ii) find /home/chipo -name *.sxw | grep cv
        iii) ping 192.168.4.155

Question 2.
a) Draw a block diagram of the picoJava II.

b) Describe the general idea of the direct mapped cache.

c) What is the major problem with the direct memory cache, and what is the name of the cache design to circumvent it?

Question 3.
a) Itemise and briefly explain all the problems of the Pentium II

b) How does the template concept contribute to the increased performance of the IA64?

Question 4.
What in your opinion are the basic / minimum useful commands for a text editor?

Question 5.

Consider this program snippet, where the symbols have their conventional meanings, introduced in the course:

```
----------------------------------------------------------------
            ENT calc
            EQU localVar        5

calc        ILOAD localVar
            IF_ICMPEQ L1
            BIPUSH     2
            ISUB
            ISTORE localVar
l1:         IRETURN   0

----------------------------------------------------------------
```

An extract from the JVM opcode table is:

hex code	operand code	operand length in bytes
10	BIPUSH	1
9F	IF_ICMPEQ	2
15	ILOAD	1
AC	IRETURN	1
36	ISTORE	1
64	ISUB	none

Do the work of Pass 1 of an assembler and construct the program in hexadecimal and hence construct the symbol table.

6. Explain each tag of this html extract:

```
<html>
<head>
  <title>studentWork</title>
</head>
<body>

    <td style="vertical-align: top;"><applet code="q12345"
 codebase="../../cs341Students" height="150" width="240"></applet><br>
    </td>

</body>
</html>
```

End of examination paper.