

University of Swaziland
Faculty of Science
Department of Computer Science
Main Examination, December 2008

Title of Paper: Operating Systems

Course Number: CS442

Time Allowed: Three (3) hours

Instruction: Answer five (5) questions. Every question carries the same maximum mark.

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*. The use of a calculator is prohibited.

Special Requirement:

none.

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

Question 1. [20]

a) Give several definitions of the term *operating system*.

b) Over the years, descriptions of, and diagrams of, the operating system concept have varied. They have changed also in the level of detail presented. Present and explain some of these disparate diagrams to show how the operating systems views have changed.

Question 2. [20]

a) Is a *keyboard* an input device? Justify your answer.

b) Differentiate between *shared*, *write*, and *demand* locks.

c) Explain fully the terms *clean* and *dirty* as used with the WS clock algorithm.

d) Why are output files for the printer normally spooled on disk before being printed?

e) Differentiate between the *reiser* and *ext3* file systems.

Question 3. [20]

a) What is broken [ie: wrong, could be improved] with Unix? How would you fix it? [This question is taken from the Google Labs Aptitude Test.]

b) What is broken with (any version of) Windows? How would you fix it?

Question 4. [20]

Describe the lost update problem for three users A, B, and C, in accessing a resource called D.

Question 5. [20]

Using at least *fdisk* and *mke2fs* as your examples, how would you implement the following Unix partition layout on a virgin disk? (Discuss the issues involved in detail.)

| partition # | size MB | type | purpose |
|-------------|---------|------|-------------------------|
| 2 | 4 | swap | Linux program swap area |
| 1 | 20 | ext2 | OS Linux |
| 4 | 40 | NTFS | OS Windows |
| 3 | 30 | ext3 | users' files |

Question 6. [20]

Discuss the key issues and goals of *I/O software* in an operating system.

End of examination paper.