

# UNIVERSITY OF SWAZILAND

FACULTY OF SCIENCE

*DEPARTMENT OF COMPUTER SCIENCE*

## MAIN EXAMINATION, *NOVEMBER 2013*

Title of Paper : **Operating Systems**  
Course Number : **CS 442**  
Time Allowed : **Three (3) Hours**  
Instruction : **Answer any FIVE questions**

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

1.
  - a) Describe the features of a resource manager (operating system). [8]
  - b) Differentiate between the monolithic and a layered operating systems. [12]
  
2.
  - a) Is the idea of computer family started by IBM (on their IBM 360 system) still in operation or did it die in the 1980s? Discuss. [12]
  - b) Describe the different possible operations in the life cycle of a process. [8]
  
3.
  - a) Discuss the different interrupt types that occur on processes. [10]
  - b) What is the function of the kernel in handling process interrupts? [10]
  
4.
  - a) Give an example of a deadlock in a business setting. [5]
  - b) Spooling can result in a deadlock if not managed well. Describe two ways in which you could minimize deadlocks in a spooling system paying attention to the advantages and disadvantages of each solution. [7]
  - c) Discuss the necessary conditions for a deadlock. [8]
  
5.
  - a) Compare and contrast a buddy system and a swapping system. [8]
  - b) Differentiate between a physical address and a virtual address. [4]
  - c) Discuss segmentation (focussing on any two of its implementations). [8]
  
6.
  - a) Compare and contrast race conditions and critical regions. [10]
  - b) Discuss starvation in relation to busy waiting. [10]