



KENYA METHODIST UNIVERSITY

END OF 2ND TRIMESTER 2010 EXAMINATIONS

FACULTY : **SCIENCE AND TECHNOLOGY**
DEPARTMENT : **COMPUTER SCIENCE & BUSINESS INFORMATION**
UNIT CODE : **CISY 201**
UNIT TITLE : **OPERATING SYSTEMS CONCEPTS**
TIME : **2 HOURS**

INSTRUCTIONS

1. *Question One is compulsory*
2. *Answer any other two questions*

Question One

- a) CPU Scheduling deals with the problem of deciding which of the processes in the ready queue is to be allocated the CPU. Briefly describe clearly any three scheduling algorithms that are of the pre-emptive nature. [6 Marks]
- b) List six common system calls relating to files by operating systems giving the use of each system call. [6 Marks]
- c) Describe the algorithms for memory allocation, when using dynamic memory allocation with linked lists. [6 Marks]
- d) Distinguish between multiprogramming with fixed number of memory partitions from multiprogramming with variable number of memory partitions [6 Marks]
- e) When a page fault occurs, the operating system has to choose which page to remove from the memory to make room for the page that has to be brought in. Describe any three page replacement algorithms. [6 Marks]

Question Two

- a) Write short notes on the following terms;
 - i) Virtual memory
 - ii) IPC
 - iii) Monitors [6 Marks]

- b) The file organization refers to the physical arrangement of data on the backing storage devices such as tape and disks. Briefly describe any two types of file organisations. [6 Marks]
- c) Identify four principal events that lead to processes creation [4 Marks]
- d) Explain the difference between the long-term scheduler and short-term scheduler [4 Marks]

Question Three

- a) When memory is allocated dynamically, the operating system must manage it. The two ways to keep track of memory usage is bit maps and linked lists. Briefly explain the two ways. [6 Marks]
- b) State the elements of the process control table/ block [4 Marks]
- c) Identify the conditions necessary for a deadlock situation to hold. [4 Marks]
- d) The information stored in files must be persistent (not affected by process creation and termination). Identify any six objectives of the file management module of the operating system. [6 Marks]

Question Four

- a) We need four conditions to hold to have a good solution for the critical section problem (mutual exclusion). Identify the conditions and briefly explain them [6 Marks]
- b) The concept of a process is central to multitasking operating systems. Draw and discuss the various process states, and articulate the various state transitions along with a brief explanation of typical circumstances that would cause a process to make each of the transitions. [10 Marks]
- c) Many objectives must be considered in the design of a scheduling discipline. Identify four goals that are desirable in all systems. [4 Marks]