KIBABII UNIVERSITY COLLEGE

A CONSTITUENT COLLEGE OF

MASINDE MULIRO UNIVERSITY OF

SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF BSC COMPUTER SCIENCE

COURSE CODE: CSC 221

COURSE TITLE: PRINCIPLES OF OPERATING SYSTEMS

DATE: 30TH APRIL, 2015   **TIME**: 11.30PM–1.30PM

INSTRUCTIONS TO CANDIDATES

Answer Question One in Section A and Any other TWO (2) Questions in Section B

TIME: 2 Hours

INSTRUCTIONS
Answer **Questions ONE a**nd **ANY OTHER TWO**

QUESTION 1
a) What is a kernel of in operating system (2 mks)
.
b) Explain the five major activities of an operating system in regard to process management? (5 mks)

c) Describe the three major activities of an operating system in regard to memory management? (3mks)

d) How does device driver support contribute to an operating system's extensibility? (3mks)

e) What are the Advantages of Distributed Systems over Traditional Time-Sharing Systems? (4MKS)

f) Explain system calls that have to be executed by a command interpreter or shell in order to start a new process? (3mks)

g) Define Distributed Operating System as used in operating system? (2MKS)

h) Which operating system goals correspond to each of the following characteristics? (5mks)
a. Users cannot access services or information without proper authorization.
b. The operating system runs on a variety of hardware configurations.
c. System performance increases steadily when additional memory and processors are added.
d. The operating system supports devices that were not available at the time of its design.
e. Hardware failure does not necessarily cause the system to fail.

i)   Explain how NTFS handle data structures, how it recover from a system crash and what is guaranteed after a recovery takes place? (3mks)

QUESTION 2
a) List five services provided by an operating system and explain how each provides convenience to the users. (7 marks)
b) Explain in which cases it would be impossible for user-level programs to provide the services named in (a) above. (3 mks)

c) Describe the main advantages of the microkernel approach to system design? (3 mks)
 d) i) How could a system be designed to allow a choice of operating systems to boot from?
   ii) What would the bootstrap program need to do? (6mks)

QUESTION 3
a) i)Dynamically loadable kernel modules give flexibility when drivers are added to a system, What are the challenges to these process (5 marks)
ii)   Under what circumstances would a kernel be compiled into a single binary file, and when would it be better to keep it split into modules? Explain your answer. (5 mks)

b) i)What is the relationship between threads and processes (6 marks)**?**

ii) Describe how a multi-threaded application can be supported by a user-level threads package.. **(4** mks)

QUESTION 4
a) Using an example describe features of the most current operating system clearly pointing out how they affect the user
.
b) What is the job of the object manager? (3 mks)
c) Explain the responsibilities of the I/O manager? (2mks)

QUESTION 5
a) Define operating system and discuss the following kernel architectures: (10 mks)
    (i) Monollithic kernel (ii) Microkernel (iii) Exokernel

b) Differentiate between procedure call and system call and explain the role of context switch operation with respect to procedure Call and system call. (10 mks)