(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : **CSC 224**

COURSE TITLE : **PRINCIPLES OF OPERATING SYSTEMS**

DATE: 04/10/2021 **TIME:** 02:00 P.M – 04:00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTIONS ONE** AND **ANY OTHER TWO.**

QUESTION ONE (COMPULSORY) [30 MARKS]

a. List and briefly describe any 5 of the typical Computing resources   .   [5 Marks]

b. For each of the following pairs of terms, define each term, making sure to clarify the key difference(s) between the terms.

i. Kernel and processor   [2 Marks]

ii. Traffic controller and device handler   [2 Marks]

iii. Thread and process   [2 Marks]

c. Describe in details three memory management components found in the I/O subsystem

[6 Marks]

d. The operating system classifies schedulers differently. Give three as well as state their alternate names.   [3 Marks]

e. i. What is critical section in relation to a process?   [2 Marks]

ii. Operating systems work to ensure the smooth operations of the computer. What is the relationship between critical section of a process and mutual exclusion?   [3 Marks]

f. i. Describe the process undertaken by the operating system in checking for a deadlock in a computer   [2 Marks]

ii. Detail three different ways in which the operating system seeks to solve the problem of a deadlock   [3 Marks]

QUESTION TWO [20 MARKS]

a. i. Describe what a task control block is   [2 Marks]

ii. TCB contains many pieces of information associated with a specific process. Explain any four pieces of information found in the TCB   [8 Marks]

b. i. Give reasons for an operating system suspending a process   [2 Marks]

ii. What are the likely behaviors of a process suspended by the operating system   [4 Marks]

c. i. Is it possible to have a deadlock when there is one process involved? [1 Mark]

ii. Give reasons for your answer above. [3 Marks]

QUESTION THREE [20 MARKS]

a. Illustrate your understanding of the following as used in operating systems

i. Multithreading [2 Marks]

ii. Multiprocessing [2 Marks]

iii. Multiprogramming [2 Marks]

iv. Monoprogramming [2 Marks]

v. Loading \ [1 Mark]

vi. Swapping [1 Mark]

b. i. With the aid of a well labeled diagram, explain what fixed memory partition is and how it

works. [5 Marks]

ii. Give three disadvantages of fixed memory partition [3 marks]

iii. Describe how compaction works [2 Marks]

QUESTION FOUR [20 MARKS]

a. Why is authentication an important function in the computing system?   [3 Marks]

b. Describe three ways the operating systems applies authentication in a computing system

environment   [6 Marks]

c. Effective detection may discourage intrusion attempts. The ability to check, identify and

reduce intrusion effects and constant monitoring provides the best hope for fast discovery.

Discuss four methods the operating system uses to help in the above.   [8 Marks]

d. i. Why does a computer need an operating system to function?   [1 Mark]

ii. What difficulties will a user encounter if the computer he intends to use doesn't have an

operating system?   [2 Marks]

QUESTION FIVE [20 MARKS]

a. i. Describe a context switch .   [2 Marks]

ii. Give two reasons why it is important in multitasking   [4 Marks]

b. Consider the below processes available in the ready queue for execution.

PROCESS	BURST TIME
P1	21
P2	3
P3	6
P4	2

i. Draw the Gantt chart for the above execution using shortest job first scheduling [4 Marks]

ii. Calculate the average waiting time for the execution   [4 Marks]

c. i. Describe the two state process model.   [4 Marks]

ii. What are schedulers and detail their main task in operating systems.   [2 Marks]