



University of  
**Eldoret**

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# UNIVERSITY EXAMINATIONS

## 2021/2022 ACADEMIC YEAR

REGULAR EXAMINATION

FOR THE DEGREE OF

BACHELOR OF SCIENCE

IN

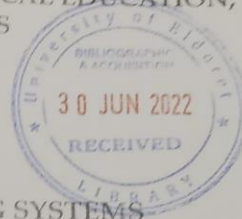
COMPUTER SCIENCE; ANALYTICAL CHEMISTRY; INFORMATION  
TECHNOLOGY; EDUCATION SCIENCE; TECHNICAL EDUCATION;  
COMMERCE; BSC ECONOMICS

COURSE CODE:

COMP 224

COURSE TITLE:

OPERATING SYSTEMS



DATE: 13<sup>TH</sup> APRIL, 2022

TIME: 12.00 NOON – 3.00PM

### INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF (2) PRINTED PAGES. PLEASE TURN OVER

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INFORMATION TECHNOLOGY/ EDUCATION SCIENCE/ TECHNICAL EDUCATION  
/COMMERCE / BSC ECONOMICS  
APRIL 2022

COMP 224: OPERATING SYSTEMS

Question 1 [16 Mks]

- Consider performance of FCFS, SJF AND RR (Quantum of 5 seconds) scheduling algorithms for three computer-bound processes. P1 (takes 10 seconds), P2 (takes 6 seconds) and P3 (takes 5 seconds). If arrive in order P1, P2, P3 **one** second apart, what is :- i. Average Waiting Time? ii. Average Turnaround Time? iii. Throughput? [10 Mks]
- Explain the different states of a process, in each, describe an event that might cause such a transition. [6 Mks]

Question 2 [15 Mks]

- State the solutions to deadlocks in operating systems. [4 Mks]
- Give five solutions to any five threats to operating systems of the future? [5 Mks]
- Name three advantages and three disadvantages of user-level threads. [6 Mks]

Answer any Three Questions from this section

Question 3 [13 Mks]

- Explain why Ubuntu operating system is safe and not affected by viruses? [5 mks]
- An operating system has five major responsibilities for managing memory. Explain them. [5 Mks]
- Briefly explain the concept of swapping and relocation in memory management in operating systems. [3 Mks]

Question 4 [13 Mks]

- What are three requirements of any solution to the critical sections problem? Why are the requirements needed? [6 Mks]
- With the help of a diagram, Explain the structure of Linux Operating Systems. [7 Mks]

Question 5 [13 Mks]

- Explain the four conditions required for deadlock to occur. [4 Mks]
- For single unit resources, we can model resource allocation and requests as a directed graph connecting processes and resources. Use an example of such a graph to show what is involved in deadlock detection. [4 Mks]
- In order to achieve efficiency in I/O management, the OS has structured it into layers. Explain these layers briefly. [5 Mks]

Question 6 [13 Mks]

- Explain any four types of operating systems and justify the need for each. [8 Mks]
- Describe the four memory allocation algorithms. Which one do you prefer? [5 Mks]

Question 7 [13 Mks]

- How can a user program disturb the normal functioning of a system? [3 Mks]
- What is the relationship between threads and processes? [4 Mks]
- What is the difference between paging and segmentation? [5 Mks]

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