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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
SECOND YEAR, FIRST SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE

KCS 202 - INTRODUCTION TO OPERATING SYSTEMS

Date: 6th December, 2022
Time: 8:30am – 10:30am

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Briefly explain the relationship between threads and processes. (4 Marks)
- b) List four advantages of multiprogramming systems. (4 Marks)
- c) Identify and explain the different approaches to implement inter-process communication in a system. (6 Marks)
- d) Explain the inconveniences that a user can face while interacting with a computer system, which is without an operating system? (6 Marks)
- e) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds. Suppose that the processes' arrival time and burst time are as shown in the table below.

Process	Arrival Time	Burst Time
P ₁	0	12
P ₂	3	12
P ₃	6	6
P ₄	6	10

Use the Round Robin Algorithm on a quantum of 4 to;

- i) Calculate the Waiting Time in each process (3 Marks)
- ii) Calculate the Total Around Time in each process (3 Marks)
- iii) Draw the Gantt chart representing these processes. (4 Marks)

QUESTION TWO (20 MARKS)

- a) Analyze why round robin algorithm is considered better than first come first serve algorithm. (4 Marks)
- b) What is a kernel? Discuss the four types of Kernel in Operating System. (8 Marks)
- c) Explain four conditions that may cause a deadlock to arise during processes execution. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Highlight four types of system calls in a computer system. (4 Marks)
- b) Discuss different process states that changes as a process is being executed. (8 Marks)
- c) Describe the two models of inter-process communication as a component managed by an operating system. (8 Marks)

QUESTION FOUR (20 MARKS)

- a) Explain clearly main tasks that are performed by a kernel in operating system. (4 Marks)
- b) Explain four characteristics of first come first served scheduling algorithm. (8 Marks)
- c) The operating system is responsible for different activities in regard to file system management. Discuss. (8 Marks)

QUESTION FIVE (20 MARKS)

- a) Describe how buffering can improve the performance of a computer system. (4 Marks)
- b) The operating system performs the task of scheduling processes based on priorities using different algorithms. Discuss any four types of these algorithms of process scheduling. (8 Marks)
- c) The classes of modern operating system may be classified by the nature of interaction that takes place between the computer and the user. State and explain any four classes of operating system you know. (8 Marks)