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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
FOR THE CERTIFICATE IN INFORMATION TECHNOLOGY
CIT 1004 – OPERATING SYSTEM

Date: 14TH December 2023
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) What is the relationship between threads and processes? (4 Marks)
- b) What is waiting time? (2 Marks)
- c) List TWO advantages & disadvantages of Time-sharing OS (4 Marks)
- d) Differentiate between the following types of operating systems. (4 Marks)
 - i) Multi-user vs Single-user
 - ii) Multi-tasking vs Single-tasking
- e) In process scheduling, explain what is a context switch? (4 Marks)
- f) List and Explain four advantages of multiprogramming in Operating System. (4 Marks)
- g) Explain what is external fragmentation? Suggest a possible solution to this issue both in contiguous memory allocation and non-contiguous memory allocation. (4 Marks)
- h) What is swapping as used in memory management? Explain the role of swapping in Operating system memory management. (4 Marks)

QUESTION TWO (20 MARKS)

- a) Deadlock prevention is accomplished by preventing any of the Coffman conditions from occurring. Briefly explain how the four conditions can be prevented. (6 Marks)
- b) Discuss the three requirements that a solution to a critical section problem must satisfy. (6 Marks)
- c) Discuss the four conditions necessary for a deadlock to occur. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Compare and Contrast the Long-Term Scheduler, Short-Term Scheduler & Medium-Term Scheduler. (10 Marks)
- b) Define the following terms:
 - i) Multitasking
 - ii) Multiprogramming
 - iii) Operating System
 - iv) Paging
 - v) Fragmentation in Memory (10 Marks)

QUESTION FOUR (20 MARKS)

- a) Explain the meaning of the terms below and point out their effect on performance of the computer from the user's view
- i) Pre-emptive multitasking (3 Marks)
 - ii) Non-pre-emptive multitasking (3 Marks)
- b) What are the advantages and disadvantages of the following OPERATING SYSTEMS Types
- i) Batch Operating System (2 Marks)
 - ii) Time Sharing Operating Systems (2 Marks)
 - iii) Distributed Operating System (2 Marks)
 - iv) Network Operating System (2 Marks)
 - v) Real Time Operating (2 Marks)

QUESTION FIVE (20 MARKS)

- a) Explain what is a process in operating system (2 Marks)
- b) Discuss various process scheduling algorithms (8 Marks)
- c) State and explain the difference between paging and segmentation (6 Marks)
- d) Explain various methods for handling deadlock (4 Marks)