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

Date: 20TH APRIL 2023
Time: 8:30AM – 10:30AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Using a diagram explain the concept of an operating acting as the bridge between the computer hardware and software (4 Marks)
- b) Briefly explain what a deadlock is in process management (2 Marks)
- c) Discuss two major functions of an Operating system (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) Deadlock prevention is accomplished by preventing any of the Coffman conditions from occurring. Briefly explain how the four conditions can be prevented (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) Discuss the critical section problem in process management. (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) Discuss various operating system types (10 Marks)
- b) Define the following terms: (10 Marks)
- i) Multitasking
 - ii) Multiprogramming
 - iii) Spooling
 - iv) Thread
 - v) Context switch

QUESTION FOUR: (20 MARKS)

- a) With the aid of a diagram, explain the various process states that exist during execution of a program. (6 Marks)
- b) Discuss the two major types of user interfaces provided by the operating systems. (6 Marks)
- c) Discuss four considerations made in CPU scheduling criteria (8 Marks)

QUESTION FIVE: (20 MARKS)

- a) Explain what is a process in operating system concepts? (2 Marks)
- b) Discuss various process scheduling algorithms (8 Marks)
- c) Discuss three major activities of an operating system in regard to memory management? (6 Marks)
- d) Explain various methods for handling deadlock (4 Marks)