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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
FOR THE CERTIFICATE IN INFORMATION TECHNOLOGY
CIT 1004 – OPERATING SYSTEMS

Date: 15TH DECEMBER 2022
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. (6Marks)

(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)