KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE CERTIFICATE IN INFORMATION TECHNOLOGY
CIT 1004: OPERATING SYSTEM

Date: 16TH APRIL 2024
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;
   i)   Multi-user vs Single-user   (2 Marks)
   ii)   Multi-tasking vs Single-tasking   (2 Marks)

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

i)   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.   (4 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   (2 Marks)
   ii)   Multiprogramming   (2 Marks)
   iii)   Operating System   (2 Marks)
   iv)   Paging   (2 Marks)
   v)   Fragmentation in Memory   (2 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 users 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 system 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 system. (2 Marks)

c) Discuss four considerations made in CPU scheduling criteria. (4 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) State and explain the difference between paging and segmentation. (6 Marks)

d) Explain various methods for handling deadlock (4 Marks)