MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRSTYEAR SPECIAL / SUPPLEMENTARY EXAMINATIONS FOR

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 107 INTRODUCTION TO OPEARTING SYSTEMS

SIT 121 OPERATING SYSTEMS

DATE: **TIME:**

INSTRUCTIONS:

Answer Question ONE and any other TWO Questions

QUESTION ONE (30 MARKS)

a) Discuss TWO services of an operating System. (4 marks)

b) Distinguish between program and a process. (4 marks)

c) List TWO advantages of real-time Operating system (2 marks)

Using the table provided to answer the following question. The burst time is in milliseconds.

d) Using FCFS and Shortest Remaining Time First algorithms compute the waiting time and average waiting time. Discuss your findings. (8 marks)

Process	Arrival Time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

e) Discuss FOUR benefits of multithread programming. (4 marks)

f) List two criteria you would use to choose a scheduling algorithm (2 marks)

g) In your own understanding explain the term deadlock. (2 marks)

h) Explain FOUR goals of security in Operating Systems (4 marks)

QUESTION TWO (20 MARKS)

a) Explain how we can prevent deadlock in Operating System (8 marks)

b) Discuss FOUR levels of Operating systems security. (8 marks)

c) Explain TWO reasons for inter-process communication in Operating systems. (4 marks)

QUESTION THREE (20 MARKS)

a) Discuss TWO models for the relationship between user kernel and system kernel in Operating Systems. (4 marks)

b) Discuss FIVE types of system calls in Operating System (10 marks)

c) Explain THREE network threats. (6 marks)

QUESTION FOUR (20 MARKS)

a) With the aid of a well labeled diagram explain the scheduling queue. (8 marks)

b) Based on the factor of waiting time, draw a comparison between round robin and priority based scheduling. (4 marks)

c) What is the difference between external and internal fragmentation in memory. (4 marks)

d) Giving examples explain TWO types of operating system used in computers including microcomputer. (4 marks)

QUESTION FIVE (20 MARKS)

a) During program execution, some processes stay in the ready queue indefinitely without being allocated the CPU. Explain the cause of this situation and the solution to this problem with regard to scheduling algorithm. (4 marks)

b) Discuss how a CPU achieves context switching when a program is running. (4 marks)

c) Explain three situations under which a child process can be terminated. (6 marks)

d) Discuss THREE reasons why processes need to cooperate. (6 marks)