



MACHAKOS UNIVERSITY

University Examinations for 2019/2020

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

CERTIFICATE OF INFORMATION COMMUNICATION TECHNOLOGY

1920/106: OPERATING SYSTEMS

DATE: 3/9/2021

TIME: 11:30 – 2:30 PM

Instructions:

This paper consists of **TWO** sections, **A** and **B**.

Answer all questions in section **A** and any four (4) in section **B**.

SECTION A (40 marks)

Answer **ALL** questions in this section

1. Junta intends to purchase an operating system for his computer. Describe **two** factors he should consider. (4 marks)
2. Define each of the following terms as used in memory management:
 - a. Deadlock;
 - b. Starvation. (4 marks)
3. Explain any **two** limitations associated with round robin scheduling algorithm. (4 marks)
4. Explain each of the following types of operating systems stating the most appropriate area where it could be applied:
 - a. Real time operating system;
 - b. Distributed operating system;
 - c. Network operating system. (6 marks)
5. Jane intends to buy a computer with a Liquid Crystal Display (LCD), describe **two** advantages she will get from her decision. (4 marks)
6. Differentiate between *one level* and *two level* directory systems. (4 marks)
7. Explain how priority scheduling algorithm deals with the problem of starvation on processes with lower priority. (2 marks)
8. Outline the function of each of the following commands as used in operating systems:
 - a. Dir
 - b. Cd..
 - c. Md
 - d. C: (4 marks)

9. Differentiate between *virtual* and *physical* memory addressing as used in operating systems. (4 marks)
10. June was required to list objectives for a proposed file system in her company, outline **four** objectives that she was likely to list. (4 marks)

SECTION B (60 marks)

Answer any **FOUR** questions in this section

QUESTION 11

- a) With the aid of a diagram, describe circular wait in process management. (4 marks)
- b) ICT module 1 students in Machakos University were carrying out an assignment on objectives of memory management in operating systems. Explain **four** objectives that they could have mentioned. (4 marks)
- c) Define the term *virtual memory* as used in memory management. (3 marks)
- d) Explain **two** circumstances under which a pre-emptive scheduling decision would be made by the operating system during inter-process communication. (4 marks)

QUESTION 12

- a) Outline two functions of the system clock in a computer system. (2 marks)
- b) Describe **one** function of a job control language as used in operating systems. (3 marks)
- c) The following options are displayed while installing operating system software on a computer:
 a. Custom;
 b. Full.
 State the function of each of the options when selected. (4 marks)
- d) Jesse has realized that all the active tasks on his computer system are deadlocked. Explain **three** approaches he could employ to recover from this situation. (6 marks)

QUESTION 13

- a) Andre intends to acquire a flat panel visual display unit for her computer, describe **two** types she could choose from. (4 marks)
- b) Suppose we have 4 processes that arrived in the order P1, P2, P3 and P4 and their burst times is as provided.

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

Considering the Shortest Job first scheduling algorithm,

- (i) Draw the Gantt chart;

(3 marks)

- (ii) Calculate the average waiting time for the processes; (4 mark)
(iii) Calculate the average turn around time. (4 marks)

QUESTION 14

- a) Process synchronization is important during execution. Explain **four** methods employed by operating systems to achieve it. (8 marks)
b) The operating systems are continuously evolving. Explain **two** ways of coping with this trend. (4 marks)
c) With the aid of a diagram, describe *swapping* technique as applied in memory management. (3 marks)

QUESTION 15

- a) Describe **four** scheduling criteria that an operating system could use to select a scheduling algorithm for a particular situation and environment. (8 marks)
b) With the aid of a diagram describe *fixed size partition* memory management technique. (4 marks)
c) Describe **three** main characteristics of the 3rd generation operating systems. (3 marks)

QUESTION 16

- a) Monica intends to design an operating system with desirable fetching from the available memory. Describe **two** fetch policies she could consider. (4 marks)
b) Differentiate between *reserved* and *committed* pages as used in virtual memory management. (4 marks)
c) With the aid of a diagram, describe the *paged* memory management technique. (6 marks)
d) Describe the term *thrashing* as used in memory management. (1 marks)