



UGANDA INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
END OF SEMESTER ONE EXAMINATIONS
ACADEMIC YEAR 2024/2025

DEPARTMENT: ICT

SEMESTER: ONE

PROGRAMME(S): DIPLOMA IN COMPUTER SCIENCE (DCS)

YEAR OF STUDY: ONE

COURSE: OPERATING SYSTEMS

COURSE CODE : CSC112

DATE: SUNDAY 15TH, DECEMBER 2024

TIME: 9:00 PM – 12:00 NOON

DURATION: 3 HOURS

INSTRUCTIONS:

- (i) This paper contains two Sections: A (40 marks) & B (60 marks).
- (ii) Attempt ALL questions in Section A, and ONLY THREE questions in Section B.
- (iii) All questions in Section B carry equal marks.
- (iv) Credit will be given for use of relevant examples and illustrations.
- (v) Begin each number in Section B on a new page of the answer sheet.
- (vi) DO NOT write on this question paper.

OPERATING SYSTEMS

SECTION A [40 MARKS]

Attempt **ALL** the Questions in this Section.

- a) Define the term file as used in operating systems. (2 marks)
- b) Briefly describe random access file access method. (2 marks)
- c) Define a deadlock as used in operating systems. (2 marks)
- d) List any two operating systems used on mobile phones. (2 marks)
- e) List four resources used by an operating system. (4 marks)
- f) Distinguish between authentication and authorization. (4 marks)
- g) Describe any four functions performed by the operating system. (4 marks)
- h) Distinguish Long Term Scheduling from Short Term Scheduling. (4 marks)
- i) Define virtual memory. (2 marks)
- j) Define file management as used in operating systems. (2 marks)
- k) What is *swapping* as used in memory management? (2 marks)
- l) What is the difference between internal memory fragmentation and external memory fragmentation? (4 marks)
- m) Define a device driver as used in operating system. (2 marks)
- n) Outline any two differences between pre-emptive scheduling and non-preemptive scheduling. (4 marks)

SECTION B [60 MARKS]

Attempt **ONLY THREE** Questions in this Section.

Question 1

- a) Describe any **four** functions of file management. (8 marks)
- b) Describe any **four** functions performed by the operating system. (8 marks)
- c) Describe any **three** process states (6 marks)

Question 2

- a) Define the term a *process* as used in operating systems. (2 marks)
- b) Describe the five-state transition model (10 marks)
- c) Given three processes P₁, P₂ and P₃ with burst times indicated against each as shown below:

Process	Burst Time
P ₁	24
P ₂	3
P ₃	3

Suppose the processes arrive in the order P₂, P₁ and P₃. Determine the average waiting time if the scheduling follows:

OPERATING SYSTEMS

- i) First Come First Served Algorithm (4 marks)
- ii) Round Robin Algorithm with quantum time of 4. (4 marks)

Question 3

- a) Describe any **three** memory placement algorithms. (6 marks)
- b) Describe the difference between contiguous memory allocation and fixed partition memory allocation schemes. (4 marks)
- c) Identify and describe the Components of the I/O Subsystem (8 marks)
- d) Define segmentation as used in memory management. (2 marks)

Question 4

- a) Describe any **three** conditions necessary for deadlocks to occur. (6 marks)
- b) Describe any **four** strategies for dealing with deadlocks (8 marks)
- c) Define each of the terms; latency, transfer time and seek time as applied to hard disk (6 marks)

Question 5

- a) Briefly explain the following types of devices (2 marks @)
 - i) Dedicated Devices
 - ii) Shared Devices and
 - iii) Virtual Devices
- b) Explain **three** factors that determine Access Time. (6 marks)
- c) Describe the following terms as used with hard disks:
 - i) Disk platter (2 marks)
 - ii) Disk arm (2 marks)
 - iii) Track (2 marks)
 - iv) Sector (2 marks)

Question 6

- a) Describe the components of the I/O Subsystem (8 marks)
- b) State three conditions that may result into Switching Process (6 marks)
- c) Distinguish between contiguous and non-contiguous memory (4 marks)

END