PAN AFRICA CHRISTIAN UNIVERSITY
EXAMINATIONS PAPER

PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT:	**COMPUTING & INFORMATION TECHNOLOGY**
COURSE CODE:	**BIT103/BSIT 103**
CAMPUS:	**ROYSAMBU**
COURSE TITLE:	**OPERATING SYSTEMS**
EXAM DATE:	**MONDAY 15TH DECEMBER ,2025**
TIME:	**2:00PM -4:00PM**
DURATION:	**2 HOURS**

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other THREE questions in Section **B.**
- Write only your **student number** on the answer booklet provided.

SECTION A (Answer ALL questions)
QUESTION ONE (15 Marks) Compulsory

a) PAC University recently deployed a new Learning Management System (LMS) hosted on a central server to support blended learning.
   i. Describe **TWO** functions of the operating system that are critical in managing this server. (4 Marks)
   ii. Discuss **THREE** strategies that the PAC University IT team can use to prevent or handle deadlocks when multiple students access limited resources such as printers or database locks. (3 Marks)

b) Explain the relationship between computer hardware, operating system, utility programs, and application programs. (4 Marks)

c) Explain **THREE** reasons for employing time sharing operating systems (3Marks)

d) Explain **ONE** type of scheduler applied to handle process in operating systems (1 Marks)

SECTION B: (ANSWER ANY THREE (3) QUESTIONS IN THIS SECTION)

QUESTION TWO (15 marks)

a) Distinguish between the following terms providing relevant examples:(4 Marks)
   i. Starvation and Deadlock
   ii. Paging and Segmentation

b) Explain **FIVE** desirable features of a good CPU scheduling algorithm. (5 Marks)

c) Using suitable examples, describe the operation of the following process scheduling algorithms: (6 Marks)
   i. Round Robin Scheduling
   ii. Multilevel Feedback Queue Scheduling

QUESTION THREE (15 marks)

a) The table below shows processes scheduled using the FCFS algorithm.

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

i. Describe FCFS algorithm (2 Marks)
ii. Construct the Gantt chart for the given processes. (4 Marks)

iii. Calculate the Waiting Time for each process. (4 Marks)
iv. Compute the Average Waiting Time (1 Marks)

b) Discuss **TWO** reasons for preferring FCFS scheduling technique (4 Marks)

QUESTION FOUR (15 marks)

a) With the aid of a well labelled diagram explain many to many multithreading model (4 marks)
b) XYZ wants its servers to run efficiently. Explain **TWO** disk management techniques that can help improve disk performance and optimize storage use. (4 Marks)
c) Discuss **ONE** advantage and **ONE** disadvantage of using Solid State Drives (SSDs) compared to magnetic disks. (4 Marks)
d) Differentiate between a File System and a File Control Block (FCB). (3 Marks)

QUESTION FIVE (15 marks)

a) Explain **THREE** relevant utility programs needed to be installed in a computer for proper operation (6Marks)

b) Explain **TWO** factors that may lead to a process switch in an operating system. (2 Marks)
c) Discuss **FIVE** considerations that I&M bank should make when selecting an operating system for its computers. (5 Marks)
d) Discuss **TWO** situations where the entire program is not required to be loaded fully in main memory. (2Marks)

QUESTION SIX (15 marks)

a) HopeTech Ltd., a Nairobi-based fintech company, recently suffered a ransomware attack that affected its operating systems and client data. Explore **FIVE** techniques operating systems use to enhance security and protection. (5 Marks)
b) Discuss **TWO** types of files and their extensions (4Marks)

a) Explain **TWO** disadvantages of distributed operating systems (2Marks)
b) Analyze **FOUR** stages a process passes in executing (4 marks)

EOF

