

PAN AFRICA CHRISTIAN UNIVERSITY

BBIT, BSCIT

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BIT/BSIT 103

CAMPUS: ROYSAMBU

COURSE TITLE: PRINCIPLES OF OPERATING SYSTEMS

EXAM DATE: MONDAY, DATE (6TH DECEMBER 2024)

TIME: START HOUR – END 2:30-5:30 HRS

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.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION 1

- a) The process control block is a data structure containing certain important information about the process. Explore information contained in the PCB.

[6

Marks]

- b) Discuss the following scheduling algorithms as applied in operating system.

- | | |
|---|------------------|
| i. FIFO | [1 Marks] |
| ii. Shortest Job Next (SJN) or Shortest Job First (SJF) | [1 Marks] |
| iii. Round Robin (RR) | [1 Marks] |
| iv. Priority Scheduling | [1 Marks] |

SECTION B

(Answer any THREE (3) questions in this section)

QUESTION 2

- a) Discuss **TWO** types of files and their extensions **[4Marks]**
- b) Briefly describe the term process and explain **FIVE** process states **[6 Marks]**

QUESTION 3

- a) Discuss **THREE** functions of the high-level scheduler in a computer system managing multiple processes. **[6 Marks]**
- b) Victoria is responsible for ensuring the seamless operation of the company's computer systems. Explore **FOUR** key functions of the operating system that she can rely on. **[4Marks]**

QUESTION 4

- a) Explain the relationship between operating system, computer hardware, utility programs and application programs. **[6Marks]**

- b) Discuss **TWO** major methods of allocating disk space and explain how they differ from each other **[4 marks]**

QUESTION 5

- c) Describe the **THREE** conditions for deadlock in an operating system, considering a scenario where multiple processes are competing for resources. **[6Marks]**
- d) Assuming you are managing a multi-user operating system in the PAC University lab, describe **TWO** ways to handle processor scheduling to ensure fairness among students using the computers for different applications **[4Marks]**

QUESTION 6

The table below shows the processes with their Arrival time, Execution time and Service time. Use it to answer the questions below

Process	Arrival Time	Execution Time	Service Time
P0	0	4	0
P1	1	3	5
P2	2	7	17
P3	4	6	6

- i. By applying the shortest job first technique explain steps followed to calculate the waiting time for each process **[4 Marks]**
- ii. Discuss steps followed to calculate average waiting time **[2 Marks]**
- iii. Discuss **TWO** reasons for preferring SJF scheduling technique **[4 Marks]**

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