

PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY

COURSE CODE: BIT103

COURSE TITLE: OPERATING SYSTEMS

CAMPUS: ROYSAMBU

EXAM DATE: DECEMBER, 2022

TIME: 5pm – 8:30pm (Wednesday)

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 in this section)

Question 1:

a) Kernel is the core component of an operating system which acts as an interface between applications, state its main function. **[2 Marks]**

b) Explain why an operating system can be viewed as a resource allocator. **[2 Marks]**

c) The operating system provides various techniques which assure the integrity and confidentiality of user data. Describe any two security measures that are used to protect user data in operating system? **[4 Marks]**

d) State the reason why process Synchronization is important in an Operating System? **[2 Marks]**

SECTION B

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

Question 2:

- a) A context switch is the mechanism to store and restore the state or context of a CPU in Process Control block so that a process execution can be resumed from the same point at a later time. Identify any two information content that is stored for later use when the process is switched.

[4 Marks]

- b) Process scheduling is an essential part of a Multiprogramming operating systems. Discuss three ways which schedulers handle process scheduling. **[6 Marks]**

Question 3:

- a) State the difference between an emulator and a virtual machine. **[2 Marks]**
- b) Virtual machines require different types of hardware support in order to work properly, describe at least three hardware components. **[3 Marks]**
- c) Explain how virtualization can help with disaster recovery in an organization to ensure business continuity in a timely manner. **[2 Marks]**
- d) Explain memory management and paging in the context of Virtual Machines.

[3

Marks]

Question 4:

An operating system manages the processor's work and all the running processes of the system. Discuss five stages a process state undertakes in operating systems process management function. **[10 Marks]**

Question 5:

- a) Explain the following terms:- **[8 Marks]**
- i) Authentication
 - ii) Data integrity
 - iii) Symmetric encryption
 - iv) Asymmetric encryption
- b) State two advantages of Distributed Systems. **[2 Marks]**

Question 6

- a) Discuss three types of file directory structures **[6 Marks]**
- b) Explain two file access methods found in a computer systems **[4 Marks]**