



PAN AFRICA CHRISTIAN UNIVERSITY

(DICT)

END-OF-SEMESTER EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT0132

CAMPUS: ROYSAMBU

COURSE TITLE: PRINCIPLES OF OPERATING SYSTEMS

EXAM DATE: DAY OF WEEK, DATE (DDTH MONTH YEAR)

TIME: START HOUR – END 13:00-17:00HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer question **ONE** and any other **THREE** questions.
- 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) Explain THREE significances of an operating system in a computer system

(3

Marks)

- b) With a relevant example, describe the concept of starvation in operating systems

(3 Marks)

- c) State TWO attributes you may use to select disk scheduling algorithms

(2

Marks)

- d) Justify the use of process scheduling in computer systems

(2 Marks)

SECTION B (Answer any THREE questions in this section)

QUESTION 2

- a) Differentiate the TWO categories of I/O devices

(4 Marks)

- b) Describe THREE roles of memory-mapped I/O as found in the operating system concept

(6 Marks)

QUESTION 3

- a) The traditional UNIX scheduler is a priority-based round-robin scheduler (also called a multi-level round-robin scheduler). Appraise how the scheduler goes about favoring I/O-bound jobs over long-running CPU-bound jobs. (4 Marks)
- b) You have been tasked with procuring an Operating System for your company's computers. You are torn between the Windows operating system and the Linux operating system. Discuss any TWO attributes that would influence your choice of the operating system. (6 Marks)

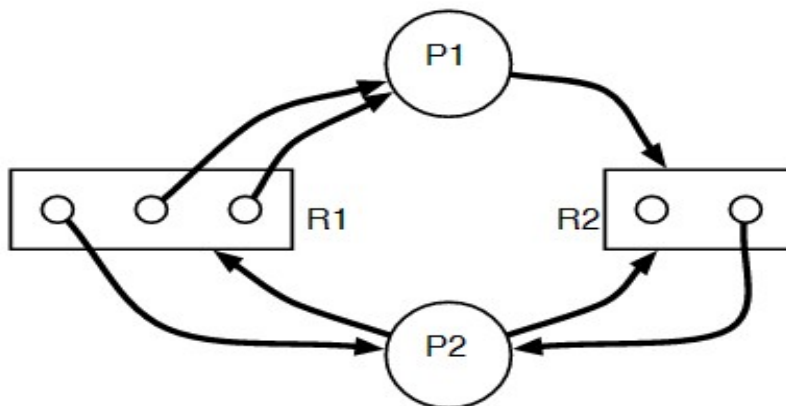
QUESTION 3

a) Virtual machine technology, often just called virtualization, makes one computer behave as several computers by sharing the resources of a single computer between multiple virtual machines. Identify FIVE benefits of Virtual Machine technology to a system administrator. **(5 Marks)**

b) As a process executes, it changes state. Describe the Five-state of a process **(5 Marks)**

QUESTION 4

a) Consider the following resource allocation graph.



- Justify if the system is deadlocked or not. **(2 Marks)**
- Explain the status of the system if P1's request for R2 is granted first. **(3**

Marks)

- Demonstrate the status of the system if P2's request for R2 is granted first. **(3 Marks)**

iv. State any TWO conditions to manage the occurrence of a deadlock.

(2

Marks)

QUESTION 6

- a) Describe TWO ways to manage starvation in computer systems **(4 Marks)**
- b) Explain THREE functions of the operating systems in relation to the overall security of a Computer System. **(6 Marks)**

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