



COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

CSC211: OPERATING SYSTEMS

END OF SEMESTER EXAMINATIONS

NOVEMBER 2019

LECTURER: KANDIERO, A

DURATION: (3HRS)

INSTRUCTIONS

1. Choose **All** questions from **Section A** and **TWO** questions in **Section B**.
 2. Use only the Examination Answer Book provided. Obtain a Continuation Answer Book if necessary.
 3. Write legibly and concisely
 4. You are expected to give a critical analysis of each question.
 5. Provide the following information on the cover page of the Examination Answer Book.
 - 5.1 Write your University I.D. number clearly in the space provided. Do not write your name on the Answer Book.
 - 5.2 Write the Course Code & Course Title indicated above in the space provided.
 - 5.3 For Faculty write 'CBPLG'
 - 5.4 For Academic Year write 2018/2019
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Section A: Answer ALL Questions

1. Define and Operating System and outline its main functions [5 Marks]
2. Outline and describe and types of operating systems, give real world examples [10 Marks]
3. Make a brief presentation and synthesis of operating systems services [10 Marks]
4. Use a concept diagram define and illustrate the following:
 - a. Batch Processing [5 Marks]
 - b. Multitasking [5 Marks]
 - c. Multiprogramming [5 Marks]
 - d. Spooling [5 Marks]
5. Outline and describe operating systems security support, how is it supported in the Operating Systems installed on your machine (specific the version of operating system) [5 Marks]

Section B: Choose any TWO questions

Question 1: Operating Systems Scheduling Algorithms

- a. Define the concept of OS Scheduling Algorithm [6 Marks]
- b. Illustrate calculations for:
 - Shortest Job First (SJF), [6 Marks]
 - Priority Based (PB), [6 Marks]
 - Round Robin (RR), [6 Marks]
 - Scheduling algorithms. [6 Marks] Use the tables below to show your calculations.

Shortest Job First (SJF)

- Best approach to minimize waiting time.
- Impossible to implement
- Processer should know in advance how much time process will take.

Process	Arrival Time	Execute Time	Service Time
P0	0	5	0
P1	1	3	3
P2	2	8	8
P3	3	6	16

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Wait time for each process

Process	Wait Time: Service Time – Arrival Time

Priority Based Scheduling

- Each process is assigned a priority. Process with highest priority is to be executed first and so on.
- Processes with same priority are executed on first come first serve basis.
- Priority can be decided based on memory requirements, time requirements or any other resource requirement.

Process	Arrival Time	Execute Time	Priority	Service Time
P0	0	5	1	0
P1	1	3	2	3
P2	2	8	1	8
P3	3	6	3	16

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Wait time for each process

Process	Wait Time: Service Time – Arrival Time

Round Robin Scheduling

- Each process is provided a fix time to execute called quantum.
- Once a process is executed for given time period. Process is preempted and other process executes for given time period.
- Context switching is used to save states of preempted processes.

Process	Arrival Time	Execute Time
P0	0	5
P1	1	3
P2	2	8
P3	3	6

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Wait time for each process

Process	Wait Time: Service Time – Arrival Time

Question 2: Operating Systems Process Algorithms

- a. Define an operating system process [5 Marks]
- b. Outline and describe the four components of an operating system [10 Marks]
- c. Outline and describe the five main operating system process states, use a process state diagram [15 Marks]

Question 3: Memory Management

- a. Define Memory Management [5 Marks]
- b. Describe and illustrate memory management techniques [10 Marks]
- c. Define and illustrate logical v/s actual address space [15 Marks]

Question 3: Virtual Memory

Define and illustrate the following concepts using concept diagrams

- a. Virtual Memory **[5 Marks]**
- b. Demand Paging **[10 Marks]**
- c. Page Replacement Algorithm **[15 Marks]**

All the Best!!

Boa Sorte!!