FOUNTAIN UNIVERSITY OSOGBO, NIGERIA

P.M.B.4491, OSOGBO, OSUN STATE.

COLLEGE OF NATURAL AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES

SECOND SEMESTER EXAMINATION 2020/2021 SESSION

CPS 206: OPERERATING SYSTEM I **Credit Unit/Status: 2 (C)**

Time Allowed:1hrs 30mins 24/08/2021

INSTRUCTION(s): ANSWER ALL IN SECTION A AND ANY TWO (2) IN SECTION B

SECTION A: ATTEMPT ALL QUESTIONS

(a) Give a simple definition of an Operating System (OS). [2 Marks]

(b) Justify the need for an Operating System in any Computer system. [2 Marks]

(c) In your opinion, why do you think it is important to learn about OS, since most of us may not be writing or design OS? [2 Marks]

(d) Is the term "process" and "program" synonymous? Explain. [2 Marks]

(e) Explain the term Process Control Block (PCB) [2 Marks]

(f) Identify necessary Process Information maintained by the PCB. [2 Marks]

(g) Explain the term "Interrupt". [2 Marks]

(h) Mention two fundamental services provided by the OS to users. [2 Marks]

(i) Explain the core components of an OS. [10 Marks]

(j) Identify four components of a Computer System in the context of this course. [4 Marks]

SECTION B: ANSWER ANY TWO (2) QUESTION.

1. (a) In the context of Computer Science and Operating System, explain the term Process. [2 Marks]

   (b) i) Briefly describe various states that a process can be in. [4 Marks]

   ii) Identify and discuss the transitions and the events that can make a process transit from one state to the other. [6 Marks]

   (c) What are the differences and similarities between a process and a thread. [3 Marks]

2. (a) Explain the term Processor Scheduling. [2 Marks]

   (b) Describe the following scheduling algorithms

   - Non-Pre-Emptive, First Come, First Serve
   - Round Robin
   - Shortest Job First [5 Marks]

(c) Given the following processes and burst times

Process	Burst Time
P1	13
P2	5
P3	23
P4	3
P5	31
P6	3
P7	14

Calculate the average wait time when each of the above scheduling algorithms is used? Assume that a quantum of 6 is being used. [6 Marks]

(d) Which scheduling algorithm, as an operating systems designer, would you implement? [2 Marks]

Note that for RR (quantum = 8 milliseconds)

3. (a) Briefly explain the term scheduler. [2 Marks]

(b) Distinguished among the following three level of schedulers;

i. *High-level scheduler*
ii. Intermediate-level scheduler
iii. *Dispatcher* [5 Marks]

(c) Which level of scheduler should make a decision on each of the following questions?

i. *Which ready process should be assigned a processor when one become available?*
ii. *Which of a series of waiting bath processes that have been spooled to disk should net be initiated?*
iii. *Which of the processes should be temporarily suspended to relieve a short-term burden on the processor?*
iv. *Which temporarily suspended process that is known to be I/O bound should be activities to balance the multiprogramming mix?*

[8 Marks]

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SECOND SEMESTER EXAMINATION 2021/2022 SESSION

CPS 206: OPERATING SYSTEMS I **Credit Unit/Status: 2 (C)**

Time Allowed: 1hour: 45minutes 09/08/2022

INSTRUCTION(s): ATTEMPT ALL QUESTIONS IN SECTION A & ANY ONE (1) IN SECTION B.

SECTION A

Question 1

a) What do you understand by the following terms? **[2½marks each]**
   i. Operating Systems (OS) ii. Kernel iii. Process iv. Thread

b) Enumerate and briefly explain the various services rendered to the users by the OS. **[4½marks]**

c) List three (3) hardware and software resources managed by the OS. **[3marks]**

d) Why are traditional processes referred to as heavyweight weight processes? **[2marks]**

e) Enumerate at least three (3) events that could occur once a process is in running state. **[3marks]**

Question 2

a) Briefly explain the following concepts in the OS: **[2½marks each]**
   i. Interrupts ii. Context Switch iii. Process Control Block
   iv. Process Scheduling

b) Using a suitable diagram, describe the view of OS as a Computer system interface. **[3½marks]**

c) When might a system that ensures that process will complete before deadline not achieve the highest throughput? **[2marks]**

d) Differentiate between the following: **[4½marks]**
   i. Monolithic kernels and Microkernels
   ii. Process and Program
   iii. Job scheduler and CPU scheduler

SECTION B

Question 1

a) With the aid of a suitable diagram, describe the various functions provided by the kernel. **[5marks]**

b) How does improved software design helps to make multithreaded application executes faster? **[2½marks]**

c) How are the waiting, blocked and sleeping states similar, and how are they different?

[4marks]

d) Briefly explain three (3) criteria of the various algorithms that must be considered in choosing which algorithm to use in a particular situation. [6marks]

Question 2

a). How does the OS prevent a process from monopolizing a processor? [2½marks]

b) Describe the concept of co-operating processes and as well state reasons for allowing process co-operation. [4marks]

c) Enumerate three (3) circumstances that can take place during CPU Scheduling. [3marks]

d) Distinguish between the following: [8marks]

i. Time sharing OS and Real Time OS.
ii. Network OS and Distributed OS.
iii. User-level thread and Kernel-level Thread
iv. Preemptive Scheduling and Non-preemptive Scheduling.

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FIRST SEMESTER EXAMINATION 2017/2018 SESSION

CPS 205: OPERERATING SYSTEM I

Credit Unit/Status: 2 (C)

Time Allowed: 1hrs 30mins

06/03/2018

INSTRUCTION(s): ANSWER ALL IN SECTION A AND ANY **TWO (2)** IN SECTION B

SECTION A: ATTEMPT ALL QUESTIONS

(a) Give a simple definition of an operating system [2 marks]

(b) Justify the need for an operating system in any system [2 marks]

(c) In your opinion, why do you think it is important to learn about OS, since most of us may not be writing OS? [2 marks]

(d) Is the term "process" and "program" synonymous? Explain. [2 marks]

(e) Identify necessary process information maintained by the PCB. [2 marks]

(f) Explain the term Processor Scheduling. [2 marks]

(g) Explain the term "interrupt". [2 marks]

(h) Mention two fundamental services provided by the OS to users. [2 marks]

(i) Explain the core components of an OS. [10 marks]

(j) Identify four component of a Computer System. [4 marks]

SECTION B: ANSWER ANY TWO (2) QUESTION.

1. (a) Explain the term Processor Scheduling. [2 marks]

(b) Explain four (4) Scheduling Algorithm that can be used by the OS to select next process to run. [10 marks]

(c) Five processes arrive at time 0, in the order given, with the length of the CPU burst time given in milliseconds as shown below:

Process	Burst Time
P1	10
P2	29
P3	3
P4	7
P5	12

Consider the FCFS, SJF and RR (quantum = 10 milliseconds) scheduling algorithms for the above set of processes, do

a. Draw four Gantt charts illustrating the execution of these processes using the three algorithms.
b. What is the waiting time of each process for each of the scheduling algorithms considered?
c. Which algorithm would give the minimum average waiting time? [8 Marks]

2. (a) Give 5 examples of resources managed by the OS. [5 marks]

(b) State and describe the states that a process can be in, highlighting the events that can cause transition from one to the other. [10 marks]

(c) Explain the term Context Switching. [2 marks]

(d) What are the differences and similarities between a process and a thread? [3 Marks]

3. (a) Briefly explain the term scheduler [5 marks]

(b) Distinguished among the following three level of schedulers;

i. High-level scheduler
ii. Intermediate-level scheduler
iii. Dispatcher [10 marks]

(c) List 5 Criteria for Scheduling. [5 marks]

FOUNTAIN UNIVERSITY, OSOGBO
DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES
FIRST SEMESTER EXAMINATION 2015/2016 SESSION
COURSE TITLE: OPERERATING SYSTEM I UNIT: 2 UNITS
COURSE CODE: CPS 205 DURATION: 2HRS

INSTRUCTION: ATTEMPT ALL QUESTIONS IN SECTION A AND ANY TWO IN SECTION B

Section A: Attempt all questions

(a) Give a simple definition of an operating system [2 marks]
(b) Justify the need for an operating system in any system [2 marks]
(c) In your opinion, why do you think it is important to learn about OS, since most of us may not be writing OS? [2 marks]
(d) Mention two fundamental services provided by the OS to users. [2 marks]
(e) Explain the core components of an OS. [5 marks]
(f) Identify four component of a Computer System. [4 marks]
(g) Is the term "process" and "program" synonymous? Explain. [2 marks]
(h) Identify necessary process information maintained by the PCB. [2 marks]
(i) Explain the term Processor Scheduling. [2 marks]
(j) Explain the term "interrupt". [2 marks]
(k) What is the function of **power-on self test** (POST) in a computer system. [2 marks]
(l) What is the function of the **bootstrap loader**. In a computer system. [2 marks]
(m) In 940 there were no operating systems and only Assembly language developed. Yes/No. [1 mark]

Section B: Answer any two (2) question.

1. (a) Give 5 examples of resources managed by the OS. [5 marks]
   (b) State and describe the states that a process can be in, highlighting the events that can cause transition from one to the other. [10 marks]
   (c) Explain the term Context Switching. [5 marks]
2. (a) Briefly explain the term Interrupt. [5 Marks]
   (b) Differentiate between asynchronous interrupt and synchronous interrupt. [5 marks]
   (c) How did operating system takes care of interrupt? [10 marks]
3. (a) How can you describe Processor Scheduling? [2 marks]
   (b) What are the general goals of scheduling? [4 marks]
   (c) When do scheduling decisions take place in an operating system? [4 marks]
   (d) Five processes arrive at time 0, in the order given, with the length of the CPU burst time given in milliseconds:

Process	Burst Time
P_1	10

P_2	29
P_3	3
P_4	7
P_5	12

Consider the FCFS, SJF and RR (quantum = 10 milliseconds) scheduling algorithms for this set of processes.

i. Draw the Ghant chart,
ii. Calculate the Average waiting time and
iii. Which algorithm would give the minimum average waiting time?

[5 marks]

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CPS 206: OPERATING SYSTEMS I **Time Allowed: 45mins** 28/07/2022

INSTRUCTION(s): ATTEMPT ALL QUESTIONS

1. What do you understand by the following terms?
   i. Operating Systems (OS) ii. Kernel iii. Process iv. Context Switch.
2. Enumerate the various services rendered to the users by the OS. Describe the concept of co-operating processes and as well state reasons for allowing process co-operation.
3. How does the OS prevent a process from monopolizing a processor?
4. Describe the concept of co-operating processes and as well state reasons for allowing process co-operation
5. Enumerate at least three (3) events that could occur once a process is in running state.
6. In a tabular form, enumerate the differences between:
   i. Monolithic kernels and Microkernels
   ii. Time sharing OS and Real Time OS.
   iii. Process and Thread
   iv. Job scheduler and CPU scheduler
   v. Preemptive Scheduling and Non-preemptive Scheduling.

- Why are traditional processes called heavyweight proces
- How does a OS prevent a process from monopolizing a processor?
- How can a thread enter a dead state
- How are the waiting, blocked and sleeping states similar? How are they different

- Which level of scheduler should remain in the main memory and why?
- Which might a system that ensures that process will complete by deadline not achieve the highest throughput
- When is non-preemptive scheduling more appropriate than pre-emptive scheduling?

- Can a program that enters an infinite loop monopolize a preemptive system?

- Can indefinite postponement occur in a system that uses a FIFO scheduler? Assume that all processes eventually runs to completion.

- FIFO scheduling is rarely found in today's systems. Why?
- Why is SPF more desirable than FIFO when system throughput is a primary system objective