Kingdom of Saudi Arabia
Ministry of Education
College of Computers
Department of Computer Science

Course: CS 222 "Operating Systems"
Semester 2024 (452)

Exam: Final
Duration: 2 hours
Date/Time: 10:30AM 27/05

Student Name: Mark _____/50

Student ID: Section No:

For Instructor use only

Questions	1	2	3	4	5	6
Course learning Outcomes	1					

Questions	A	B	C	D	E
Clo mapped		1	1	1	1
Questions					
Allocated mark	10	1	10	13	11
Earned mark					

Total		
1		
40	10	50

Section-A. 5x2=10 Marks

I. Choose correct (best match) one of the four given answers: [4 marks]

1. **It is a table that defines access permissions between specific subjects and objects:**
   a. Stack Inspection
   c. Access Matrix
   b. Role-Based Access Control
   d. Protection
2. **Which of the following comes in different sizes:**
   a. Program segments
   c. Program Pages
   b. Program Frames
   d. All of the answers
3. **Intruder sits in data flow, masquerading as sender to receiver and vice versa means:**
   a. Session hijacking
   c. Replay attack
   b. Man-in-the-middle attack
   d. Masquerading (breach authentication)
4. **An abstract hardware of a single computer into several different execution environments:**
   a. Virtual machine
   c. Cloud computing
   b. Live migration
   d. Network Address Translation (NAT)
5. **Unauthorized modification of data leads to:**
   a. Breach of confidentiality
   c. Breach of availability
   b. Breach of integrity
   d. Denial of service (DOS)

II. Mark the below Statements True or False: [5 marks]

1. Program must be brought from disk into memory and placed within a process for it to be run. [✓]
2. A port scanning is a program that initiates a security incident under certain circumstances. [X]
3. Binary semaphore contains an integer value that can range over an unrestricted domain. [X]
4. Block and stack methods limit the number or length of parameters being passed. [X]
5. Each OS has its own I/O subsystem structures and device driver frameworks. [✓]

2+3=5 Marks

Physical Address Space?

[2 marks]

[3 marks]

[5 marks]

[5 marks]

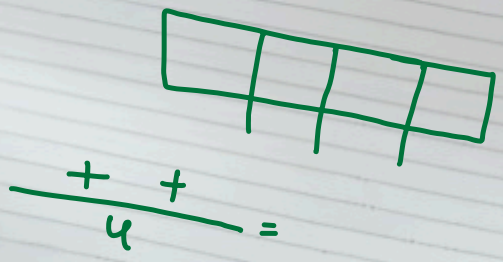
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Section-D, 6+6=12 Marks

I. Consider the following table:

Process	Duration (Burst time)	Priority
P1	21	2
P2	3	1
P3	6	4
P4	2	3

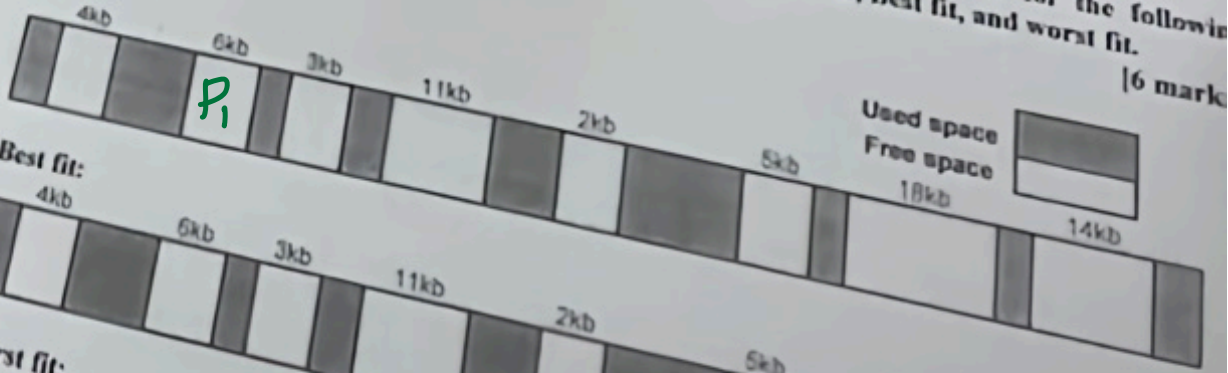
Assume that all processes arrived at time 0, use the Non-Preemptive Priority scheduling algorithm, draw the Gantt chart for the processes, and calculate the average waiting time. [6 marks]



+ + / 4 =

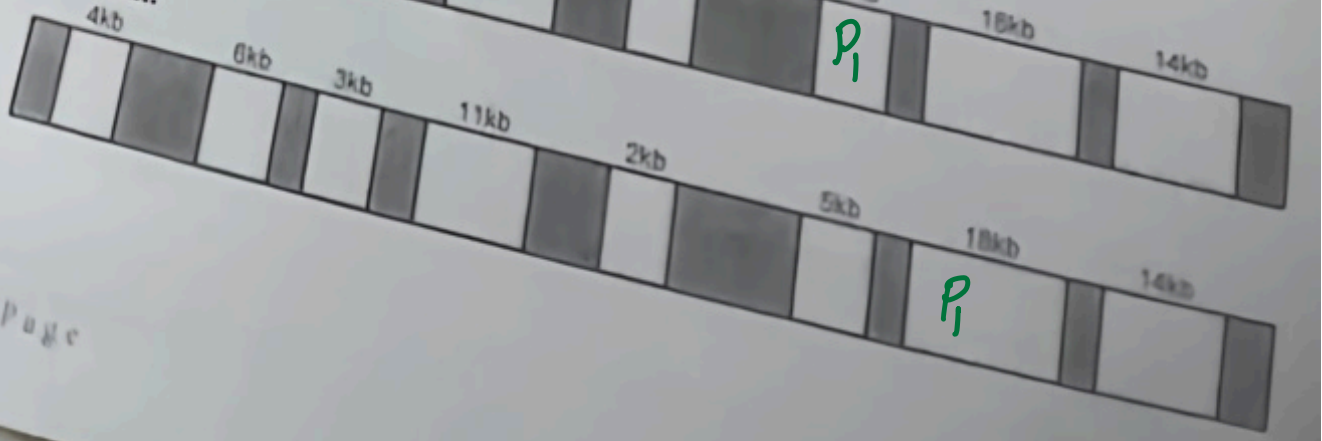
II. Apply the Dynamic Storage-Allocation method to allocate a suitable hole for the following process P1 of size 5 Kb. Determine the location of P1 using first fit, Best fit, and worst fit. [6 marks]

First fit:



Best fit:

Worst fit:



Section-E. 5×4=[3 Marks]

1. List five ways to improve performance in Input/Output Systems. [5 marks]

list 5 ways to improve performance input/output system

Reduce number of Context Switch
Reduce data coping
Reduce interrupt
use DMA
use Smart hard ware devise
Blance cpu

11. Define both Protection and Security. [4 marks]

P: controlling access of Prossece or User to ReSource defind by OS
S → System internal and externall attacks

What is the differences between signature-based detection and behavior-based detection? [4 marks]

Detection Spost Know bad Patterns
Detection Spost diffrenc from normal behavior

Good luck
Dr. Sulaiman Al amro

1. Choose

1. It is a table th
a. Stack Inspec
c. Access Mat

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a. Program segm
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3. Intruder sits in da
a. Session hijacking
c. Replay attack.

4. An abstract hardwa
a. Virtual machine
c. Cloud computing

5. Unauthorized modific
a. Breach of confidenti
c. Breach of availabil

II. Mark the below State

1. Program must be brought fr
2. A port scanning is a program
3. Binary semaphore contains an
4. Block and stack methods limit
5. Each OS has its own I/O subsys

Section-B. 2×3=6 Marks

I. What is the differences between Logical and Physical Address Space?

*L → generated by cpu also Referted Virtual address
*Ph → address seen by the memory unit
*[L and Ph Same compile time – Load time
differ → execution time

[2 marks]

II. Explain the principle of least privilege in Protection?

granting the minimum preflage to needed prefom tasks

Potientil damage
it can be Static Dynamic

[3 marks]

Section-C. 5+5=10 Marks

I. List five operations performed on Directory?

Search List Diretory
Delet
Creat
Rename
Travers

[5 marks]

List five Security Violation Categories?

Breach of confidentilial
" integiral
" availability
theft Scurity
Dos
Denial of Scurity

[5 marks]

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I. Consider the follow

Process	Durat (Burst
P1	21
P2	3
P3	6
P4	2

Assume that all processes draw the Gantt chart for t

II. Apply the Dynamic Storage- process P1 of size 5 Kb. Deter

First fit:



Best fit:



Worst fit:

