

نظم التشغيل

12:2

الخميس 24/6/2021

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Faculty of Computers & Information, Assiut University

3rd Level

Final Exam

Duration: 2 hours

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\* الإسم الرباعي (بالعربي فقط)

محمد صيري رجب عبدالله

2

\* رقم الجلوس

162018135

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\* المستوى

- ☐ الاول
- ☐ الثاني
- ☒ الثالث
- ☐ رابعة 2013
- ☐ رابعة 2014
- ☐ رابعة 2015
- ☐ رابعة 2016
- ☐ رابعة 2017

4

\* البرنامج

- ☒ عام
- ☐ بايو
- ☐ هندسة

5

\* رقم المعمل

- ☐ ج•
- ☐ د•
- ☐

- ☐ ا ب
- ☐ ا د
- ☐ ا هـ
- ☐ ا٣
- ☐ ا٢ ب
- ☐ ا٢ ج
- ☐ ا٢ د
- ☐ ا٢ هـ
- ☐ ا٣
- ☐ ا٣ ب
- ☐ ا٣ ج
- ☒ ا٣ د
- ☐ ا٣ هـ
- ☐ ا٤
- ☐ ا٤ ب

6

\* رقم الكمبيوتر

19

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\* الكود (قد تمت مراجعة بيانات الطالب ورقم الجلوس)

8

Which of the following scheduling algorithms gives minimum average waiting time?  
(2 Points)

- ☐ FCFS
- ☒ SJF
- ☐ Priority
- ☐ Round – robin

9

The first fit, best fit and worst fit are strategies to select a \_\_\_\_  
(2 Points)

- ☐ process from a queue to put in memory
- ☐ processor to run the next process
- ☒ free hole from a set of available holes
- ☐ all of the mentioned

10

If a process is executing in its critical section, then no other processes can be executing in their critical section. What is this condition called?  
(2 Points)

- ☐ critical exclusion

- ☐ asynchronous exclusion
- ☐ synchronous exclusion
- ☒ mutual exclusion

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DMA is used for \_\_\_\_\_  
(2 Points)

- ☒ High speed devices
- ☐ Low speed devices
- ☐ Utilizing CPU cycles
- ☐ All of the mentioned

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Given a FIFO scheduler, what is the average response time of the four jobs?  
(2 Points)

Process	Arrival Time	Processing
A	0	4
B	1	5
C	2	4
D	3	2

- ☐ 4.5  
☐ 5  
☒ 6.5  
☐ 8  
☐ None of the mentioned

13

A small computer has 3 page frames. A process makes the following list of page references: 1,2,3,4,2,1,5,6,7,6,3,2,1,2,3,6. How many page faults using optimal page replacement algorithm?  
(2 Points)

- ☐ 8  
☒ 10

- ☐ 12
- ☐ 14
- ☐ None of the mentioned

14

The number of processes completed per unit time is known as \_\_\_\_\_  
(2 Points)

- ☐ Capacity
- ☐ Output
- ☐ Efficiency
- ☒ Throughput

15

The real difficulty with SJF in short term scheduling is \_\_\_\_\_  
(2 Points)

- ☐ it is too good an algorithm
- ☒ knowing the length of the next CPU request
- ☐ it is too complex to understand
- ☐ none of the mentioned

16

What is a short-term scheduler?  
(2 Points)

- ☐ It selects which process must be brought into the ready queue
- ☒ It selects which process must be executed next and allocates CPU
- ☐ It selects which process must be removed from memory by swapping
- ☐ None of the mentioned

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Suppose that a process is in "Blocked" state waiting for some I/O service. When the service is completed, it goes to the \_\_\_\_\_  
(2 Points)

- ☐ Terminated state
- ☒ Ready state
- ☐ Running state
- ☐ Suspended state

18

Which one of the following is a synchronization tool?  
(2 Points)

- ☐ thread
- ☐ socket
- ☒ semaphore
- ☐ pipe



19

A system is in a safe state only if there exists a \_\_\_\_\_  
(2 Points)

- ☐ safe allocation
- ☐ safe resource
- ☐ safe sequence
- ☒ all of the mentioned

20

Assume Quantum value two, given a RR scheduler, what is the response time of job B?  
(2 Points)

Process	Arrival Time	Processing
A	0	4
B	1	5
C	2	4
D	3	2

- ☐ 0
- ☐ 1
- ☒ 2
- ☐ 3
- ☐ None of the mentioned

21

What is interprocess communication?  
(2 Points)

- ☐ communication within the process
- ☒ communication between two processes
- ☐ communication between two threads of same process
- ☐ none of the mentioned

22

The following system of four processes with two resources:  
If the availability vector is [2 3], is the system above deadlocked?  
(2 Points)

Current allocation matrix:	Current request matrix:
P <sub>1</sub> 1 3	P <sub>1</sub> 1 2
P <sub>2</sub> 4 1	P <sub>2</sub> 4 3
P <sub>3</sub> 1 2	P <sub>3</sub> 1 7
P <sub>4</sub> 2 0	P <sub>4</sub> 5 1

- ☒ Yes
- ☐ No

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When the process issues an I/O request \_\_\_\_\_  
(2 Points)

- ☐ It is placed in a waiting queue
- ☐ It is placed in the Job queue
- ☐ It is placed in an I/O queue
- ☒ It is placed in the ready queue

24

Necessary conditions for deadlock are  
(2 Points)

- ☐ non-preemption and circular wait
- ☐ Mutual exclusion
- ☒ both (a) and (b)
- ☐ none of the above

25

If no cycle exists in the resource allocation graph \_\_\_\_\_  
(2 Points)

- ☐ then the system will not be in a safe state
- ☒ then the system will be in a safe state
- ☐ all of the mentioned
- ☐ none of the mentioned

26

Which algorithm is defined in Time quantum?  
(2 Points)

- ☒ round robin scheduling algorithm
- ☐ shortest job scheduling algorithm
- ☐ multilevel queue scheduling algorithm
- ☐ priority scheduling algorithm

27

Program always deals with \_\_\_\_\_  
(2 Points)

- ☐ physical address
- ☐ relative address
- ☒ logical address
- ☐ absolute address

28

What is 'Aging'?  
(2 Points)

- ☐ keeping track of cache contents
- ☐ keeping track of how many times a given page is referenced
- ☐ keeping track of what pages are currently residing in memory

- ☐ increasing the priority of jobs to ensure termination in a finite time

29

The wait-for graph is a deadlock detection algorithm that is applicable when \_\_\_\_\_

(2 Points)

- ☐ all resources have a single instance
- ☒ all resources have multiple instances
- ☐ all resources have a single 7 multiple instances
- ☐ all of the mentioned

30

Round robin scheduling falls under the category of \_\_\_\_\_

(2 Points)

- ☒ Non-preemptive scheduling
- ☐ Preemptive scheduling
- ☐ All of the mentioned
- ☐ None of the mentioned

31

When several processes access the same data concurrently and the outcome of the execution depends on the order in which the access takes place is called \_\_\_\_\_

(2 Points)

- ☒ race condition

- ☐ critical condition
- ☐ essential condition
- ☐ dynamic condition

32

\_\_\_\_\_ is generally faster than \_\_\_\_\_ and \_\_\_\_\_  
(2 Points)

- ☒ first fit, best fit, worst fit
- ☐ best fit, first fit, worst fit
- ☐ worst fit, best fit, first fit
- ☐ none of the mentioned

33

Which of the following conditions must be satisfied to solve the critical section problem?  
(2 Points)

- ☐ Mutual Exclusion
- ☐ Progress
- ☐ Bounded Waiting
- ☒ All of the mentioned

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Assuming the above process being scheduled with the SJF scheduling algorithm (non-preemptive). The waiting time for process C is:  
(2 Points)

Process	Arrival Time	Processing
A	0	4
B	1	5
C	2	4
D	3	2

- ☐ 2  
☐ 4  
☒ 6  
☐ 8  
☐ None of the mentioned

35

The offset 'd' of the logical address must be \_\_\_\_\_  
(2 Points)

- ☐ greater than the segment number  
☐ greater than segment limit  
☒ between 0 and segment limit

- ☐ between 0 and the segment number

36

What is compaction?  
(2 Points)

- ☒ a technique for overcoming external fragmentation
- ☐ a technique for overcoming fatal error
- ☐ a paging technique
- ☐ a technique for overcoming internal fragmentation

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In contiguous memory allocation \_\_\_\_\_  
(2 Points)

- ☐ each process is contained in a single contiguous section of memory
- ☒ all processes are contained in a single contiguous section of memory
- ☐ the memory space is contiguous
- ☐ none of the mentioned

38

Virtual memory is  
(2 Points)

- ☒ an illusion of an extremely large memory
- ☐ an extremely large secondary memory
- ☐



- ☐ an extremely large main memory
- ☐ a type of memory used in super computers

39

A small computer has 3 page frames. A process makes the following list of page references: 1,2,3,4,2,1,5,6,7,6,3,2,1,2,3,6. How many page faults using FIFO algorithm?

(2 Points)

- ☐ 8
- ☐ 10
- ☒ 12
- ☐ 14
- ☐ None of the mentioned

40

Every address generated by the CPU is divided into two parts. They are

(2 Points)

- ☐ frame bit & page number
- ☒ page number & page offset
- ☐ page offset & frame bit
- ☐ frame offset & page offset

41

If a physical address is 32 bits and each page is 32KB, the top ..... bits exactly designate the physical page number

(2 Points)

- ☐ 10
- ☒ 17
- ☐ 19
- ☐ 32

42

The following system of four processes with two resources:

If the availability vector is [2 5], is the system above deadlocked?

(2 Points)

Current allocation matrix:	Current request matrix:
P <sub>1</sub> 1 3	P <sub>1</sub> 1 2
P <sub>2</sub> 4 1	P <sub>2</sub> 4 3
P <sub>3</sub> 1 2	P <sub>3</sub> 1 7
P <sub>4</sub> 2 0	P <sub>4</sub> 5 1

- ☐ Yes
- ☒ No

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The run time mapping from virtual to physical addresses is done by a hardware device called the \_\_\_\_\_

(2 Points)

- ☐ Virtual to physical mapper
- ☒ Memory management unit
- ☐ Memory mapping unit
- ☐ None of the mentioned

44

A small computer has 3 page frames. A process makes the following list of page references: 1,2,3,4,2,1,5,6,7,6,3,2,1,2,3,6. How many page faults using least-recently-used (LRU) algorithm?

(2 Points)

- ☐ 8
- ☐ 10
- ☒ 12
- ☐ 14
- ☐ None of the mentioned

45

A set of processes is deadlock if \_\_\_\_\_

(2 Points)

- ☒ each process is blocked and will remain so forever
- ☐ each process is terminated
- ☐ all processes are trying to kill each other
- ☐ none of the mentioned

46

What is the degree of multiprogramming?  
(2 Points)

- ☒ the number of processes in memory
- ☐ the number of processes in the I/O queue
- ☐ the number of processes in the ready queue
- ☐ the number of processes executed per unit time

47

When high priority task is indirectly preempted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called

\_\_\_\_\_  
(2 Points)

- ☐ priority modification
- ☐ priority removal
- ☒ priority inversion
- ☐ priority exchange

48

In internal fragmentation, memory is internal to a partition and \_\_\_\_\_  
(2 Points)

- ☐ is being used
- ☐ is not being used
- ☒ is always used

☐ none of the mentioned

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Which of the following scheduling policy is well suited for a time-shared operating system?  
(2 Points)

- ☒ Round robin
- ☐ Elevator
- ☐ FCFS
- ☐ Shortest job first

50

A binary semaphore is a semaphore with integer values \_\_\_\_\_  
(2 Points)

- ☐ -2
- ☐ -1
- ☐ 2
- ☒ 1

51

What is a long-term scheduler?  
(2 Points)

- ☒ It selects processes which must be brought into the ready queue
- ☐ It selects processes which must be executed next and allocates CPU

- ☐ It selects processes which must be removed from memory by swapping
- ☐ None of the mentioned

52

A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_\_ scheduler, to be executed  
(2 Points)

- ☐ wait, long term
- ☐ blocked, short term
- ☐ ready, long term
- ☒ ready, short term

53

In operating system, each process has its own \_\_\_\_\_  
(2 Points)

- ☒ address space and global variables
- ☐ open files
- ☐ pending alarms, signals, and signal handlers
- ☐ all of the mentioned

54

What is Response time?  
(2 Points)

- ☐ the total time taken from the submission time till the completion time

- ☒ the total time taken from the submission time till the first response is produced
- ☐ the total time taken from submission time till the response is output
- ☐ none of the mentioned

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In Operating Systems, which of the following is/are CPU scheduling algorithms?  
(2 Points)

- ☐ Round Robin
- ☐ Shortest Job First
- ☐ Priority
- ☒ All of the mentioned

56

The address generated by the CPU is referred to as \_\_\_\_\_  
(2 Points)

- ☐ Physical address
- ☒ Logical address
- ☐ Neither physical nor logical
- ☐ None of the mentioned

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The interval from the time of submission of a process to the time of completion is termed as \_\_\_\_\_  
(2 Points)

- ☐ throughput
- ☒ turnaround time
- ☐ response time
- ☐ waiting time

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