Operating systems I

(1DT044)

Operating systems and process-oriented programming

(1DT096)

Written retake exam

Wednesday 2018-08-22

Bergsbrunnagatan 15, sal 1

08:00 - 13:00

Correct answers

Mixed concepts

	Concept	Statement
1	System calls	K
2	Round Robin	T
3	Race condition	R
4	Peterson's solution	I
5	Response time	N
6	TLB	M
7	Paging	J
8	Operating system	C
9	Critical section	G
10	External fragmentation	S

	Statement
A	A notification sent to a process in order to notify it of an event that occurred.
B	Requires a priori information.
C	Controls the hardware and coordinates its use among the various application programs for the various user.
D	Sits between the main memory and the CPU registers.
E	A wrapper around the command interpreter that adds useful features that makes it easer to enter commands.
F	Entire process will block if a thread makes a blocking system call.
G	Requires mutual exclusion.
H	A variation on linked allocation.
I	A concurrent programming algorithm for mutual exclusion.
J	Solves the problem with external fragmentation.
K	Interface for requesting services provided by the operating system.
L	Enables multiple processes to share a single CPU and is an essential feature of a multitasking operating system.
M	Improves virtual address translation speed.
N	Amount of time it takes from when a request was submitted until the first response is produced.
O	Number of processes that complete their execution per time unit.
P	A non-preemptive scheduling algorithm.
Q	Suspends the execution of the parent process while the child executes.
R	Behaviour of an electronic, software or other system where the output is dependent on the sequence or timing of other uncontrollable events.
S	Total memory space exists to satisfy a request, but it is not contiguous.
T	Assigns a fixed time unit per process, and cycles through them.

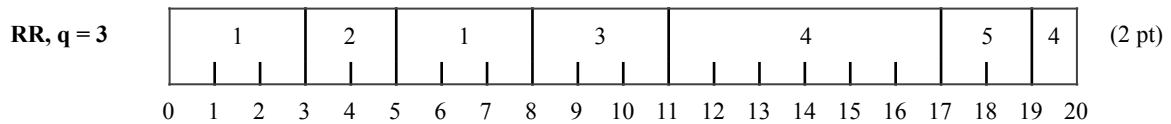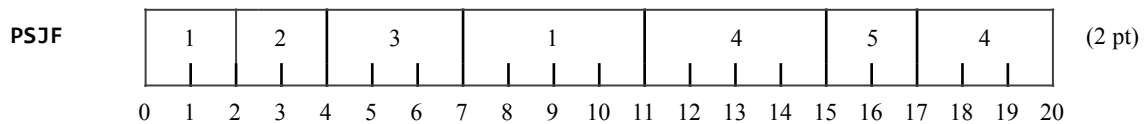| **Module 1**	**Module 2**
1.1) B	2.1) C
1.2) B	2.2) A
1.3) B	2.3) C
1.4) D	2.4) D
1.5) D	2.5) B
1.6) C	2.6) D
	2.7) B
	2.8) B
	2.9) A

Module 3

3.1) D

3.2) D

3.3) A

3.4)

Average response time = (0+1+7+1)/4 = 9/4 = 2.25

Average waiting time = [(0+2+10) + (1+1) + (7+1) + (1+7)]/4 = [12+2+8+8]/4 = 30/4 = 7.5

3.5)

PSJF

1	2	3	1	4	5	4	(2 pt)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

RR, q = 3

1	2	1	3	4	5	4	(2 pt)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Module 4

4.1) C

4.2) A

4.3) D

4.4) D

4.5) a = TRUE, b = while, c = key, D = lock

4.6)

Task	Allocation				Max				Need				Done
	A	B	C	D	A	B	C	D	A	B	C	D	
T$_0$	2	0	1	2	4	1	1	6	2	1	0	4	FALSE
T$_1$	0	1	2	0	4	3	4	0	4	2	2	0	TRUE
T$_2$	5	1	1	0	5	2	2	1	0	1	1	1	TRUE
T$_3$	0	2	3	1	2	3	6	2	2	1	3	1	TRUE

Step	Available				Choice
	A	B	C	D	
1	1	1	1	2	T2
2	6	2	2	2	T1
3	6	3	4	2	T3
4	6	5	7	3	DEADLOCK
5					-

The state is note safe.

Module 5

5.1) text, data, stack and heap

5.2) C

5.3) 0x6619

5.4) B

5.5) C