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	188 331 Operating Systems 2011 2 nd Semester Midterm Examination 24 December 2011 8:30 – 11:30
1. 2. 3.	structions: NO books, NO sheets, NO calculators are allowed. There are 26 questions, 112 marks total, attempts ALL questions. Answer in the space provided ONLY. Do NOT cheat. Any attempts to cheat will result in dismissal from class with an "F" grade.
1.	What is an operating system ?(2 marks)
2.	Why does an operating system exist ? (2 marks)
3.	Is it possible to build a computing system without an operating system? Why? (3 marks)
4.	Describe main components of an operating system. What are the purposes of those components ? (5 marks)
5.	What are differences among batch processing, multiprogramming, and time-sharing (3 marks)
6.	What are system calls? Why do we need them? (3 marks)
7.	What are differences between <i>monolithic kernels</i> and <i>microkernels</i> ? Which one is better? Why? (3 marks)

8. There are many different kinds of interrupts, what are they? Explain (5 marks)

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9.	What are differences between real mode and pre-	otected mode in the x86 architecture? (3	marks)
10.	What is a boot loader? Why most x86 boot load second-stage)? (3 marks)	ders must be divided into many stages (i.	e., <i>first-stage</i> and
11.	What are <i>processes</i> ? What are differences amon	ng processes, programs, jobs, tasks? (3	marks)
12.	Describe process states and transitions (5 marks		
13.	Suppose the process <i>P</i> executes the following content of the process of the proc		v and z in each
14.	What are threads? What are differences between	en threads and processes ? (3 marks)	

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15. In which conditions that <i>threads</i> would be better the	han processes? Why? (3 marks)	
16. In which conditions that <i>processes</i> would be better	r than <i>threads</i> ? Why ?(3 marks)	
17. What are <i>fibers</i> ? What are differences between <i>th</i> .	reads and fibers ?(3 marks)	
18. In which conditions that <i>fibers</i> are better than <i>thre</i>	eads? Why? (3 marks)	
19. In which conditions that <i>threads</i> are better than <i>fib</i>	pers? Why? (3 marks)	
20. What are differences between <i>kernel threads</i> and t	the user threads? (3 marks)	
21. Between kernel thread and user thread, which one	e is faster? Why? (5 marks)	
22. In which conditions that the <i>M-1 thread model</i> wo (5 marks)	ould be better than any other thread models? V	Why?
23. Why CPU schedulers should be <i>short-term</i> ? (3 mag)	arks)	

. Describe (differences be	etween <i>non-preemp</i> i	tive and preemp	tive scheduling (3	3 marks)									
From the	following tab	1												
	Process	Arrival Time	Burst	Priority										
	A B		<u>3</u>	4 (lowest)										
ļ	С	Arrival Time 0 1 2 4	2	2										
	D		3	1 (highest)										
26.1 Dete	rmine <i>waitin</i>	g time using FCFS ((5 marks)											
	Process	Waiting Time												
	A													
	В													
	С													
<u> </u>	D													

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24. Write a simple program to print a character A, B, and C concurrently. (10 marks)

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26.2 D	etermine	waiti	ing tir	me us	sing I	RR v	with	time	quai	ntum	= 3	(5 m	arks))					
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	A																		
	В																		
	С																		
	D																		
26.3 D	etermine	turno	aroun ——	d tim	e, us	ing	non-	pree	mpti	ve SJ	F (5	mar	ks)						
	Proce	ess									urna	roun	d Tir	ne					
	A																		
	В																		
	C																		
	D																		
26.4 D	etermine	turno	aroun ——	d tim	e, us	ing	pree	mpti	ve pr	riority	(5	marl	ks)						
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	A																		
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