Reg. No. :										
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Question Paper Code: 43805

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Third Semester

Computer Science and Engineering

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	14	4UCS305 - OPERA	ΓING SYSTEMS				
		(Regulation	n 2014)				
Dι	ration: Three hours			Maximum: 100 Marks			
		Answer ALL	Questions				
		PART A - (10 x 1	= 10 Marks)				
1.	A parent process calling _	system call wil	l be suspended until c	children processes terminate.			
2.	(a) wait The number of processes of	(b) fork completed per unit ti	(c) exit me is known as	(d) exec			
	(a) output	(b) throughput	(c) efficiency	(d) capacity			
3.	The most optimal scheduli	ng algorithm that av	oids starvation is				
	(a) First come first ser(c) Round robin	ved	(b) Shortest job fi(d) None of these				
4.	The section of code which	accesses shared var	iables is called as	·			
	(a) Critical section	(b) Block	(c) Procedure	(d) Semaphore			
5.	A Page fault occurs when						
	(a) the deadlock happe(c) when page is found		(b) when segmentation starts(d) when page is not found in the memory				
6.	A process refers to 5 page If the page replacement a internal store of 3 frames i	algorithm is FIFO,					
	(a) 8	(b) 10	(c) 9	(d) 7			

- 7. In contiguous allocation:
 - (a) each file must occupy a set of contiguous blocks on the disk
 - (b) each file is a linked list of disk blocks
 - (c) all the pointers to scattered blocks are placed together in one location
 - (d) None of these
- 8. Consider a disk with 10 blocks, where blocks 1, 4, 6, 8, 10 are free and the rest are allocated. The free space bit map would be
 - (a) 1001010101

(b) 1010100101

(c) 1001010111

(d) 0110101010

- 9. The dmesg command
 - (a) Shows user login logoff attempts
- (b) Shows the syslog file for info messages

(c) Kernel log messages

- (d) Shows the daemon log messages
- 10. Which of the following is FALSE?
 - (a) Context switch time is longer for kernel level threads than for user level threads
 - (b) User level threads do not need any hardware support
 - (c) Related kernel level threads can be scheduled on different processors in a multiprocessor system
 - (d) Blocking one kernel level thread blocks all other related threads

PART - B (5 x
$$2 = 10 \text{ Marks}$$
)

- 11. Illustrate process transition diagram.
- 12. List the necessary conditions for the occurrence of a deadlock.
- 13. When do page fault occur?
- 14. What are the operations that can be performed on a directory?
- 15. Brief about kernel modules in Linux system.

PART - C (5 x
$$16 = 80 \text{ Marks}$$
)

- 16. (a) (i) Demonstrate about the evolution of virtual machine. Also explain how virtualization could be implemented in Operating system. (8)
 - (ii) Enumerate different operating system structures and explain with a neat sketch.

(8)

Or

(b) (i) Explain in detail the various multithreaded models.

17. (a) (i) Explain the FCFS, Preemptive and Non-Preemptive versions of Shortest Job First and Round Robin (time-slice2) scheduling algorithms with Grantt Chart for the four processes given. Compare their average turn around and wait time. (10)

Process	Arrival Time	Burst time
P1	0	10
P2	1	6
Р3	2	12
P4	3	15

(ii) Define semaphore. Explain the use of semaphore in synchronization problem with an example. (6)

Or

(b) Consider the following snapshot of a system:

Process	Allocation				Max				Available			
Trocess	A	В	C	D	A	В	C	D	A	В	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following question using banker's algorithm: (i) what is the content of the need matrix? (ii) Is the system in a safe state? (iii) If the request from process PI arrives for (0, 4, 2, 0), can the request be granted immediately. (16)

18. (a) (i) With neat diagram, Explain the process of segmentation. (8)

(ii) Explain in detail demand paged memory management. (8)

Or

(b) Explain about the concepts of virtual memory in detail. (16)

19.	(a)	(i)	State about Disk Formatting and Boot Block.	(8)					
		(ii)	Explain shortest-seek-time-first (SSTF) algorithm, SCAN and C-SCAN example.	with (8)					
			Or						
	(b)	(i)	Describe the various disk allocation methods with its merits and demerits.	(10)					
		(ii)	How reliability and protection is provided in a file system.	(6)					
20.	(a)	•	plain in detail the design principles, kernel modules, process managen reduling in LINUX system.	nent, (16)					
			Or						
	(b)	(i) Describe about system components in Windows 2000.							
		(ii)	Discuss how networking is implemented in Windows 2000.	(8)					