Question Paper

Exam Date & Time: 30-May-2022 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES IV SEMESTER B.Sc. (Applied Sciences) in Engg. END SEMESTER THEORY EXAMINATION - MAY/ JUNE 2022

OPERATING SYSTEMS [ICS 243 - S2]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data may be suitably assumed

1)		With a neat diagram, explain the abstract view of various components of computer system.			(4)		
	A) B)	Outline the structure of CPU switching from process to process with a neat diagram.					
	C)	Explain how system calls are used for writing a simple program to read data from one file and copy them to another file.					
2)	A)	Consider the given in millis	following set of proc seconds: Burst Time	cesses, with the length of the CPU burst	(4)		
		P1	2	2			
		P2	1	- 1			
		P3	8	4			
		P4	4	2			
		P5	5	3			
		The processe all at time 0.	The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.				
		 i) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority), and RR (quantum=2). ii) What is the turnaround time of each process for each of the scheduling algorithms in part iii)What is the waiting time of each process for each of these scheduling algorithms? 					
	B)	Explain the benefits of various multithreaded programming.					
C) Explain any THREE threading issues in multithreaded programs.					(3)		
3)	Со	Consider the resource allocation graph in the fig. 3A.					

- Consider the resource allocation graph in the fig. 3A.
 - A)





Check whether the system is in a deadlock state otherwise find a safe sequence using Banker's Algorithm.

	B)	With the help of pseudocode, explain test() and set() of Bounded-waiting mutual exclusion.	(3)
	C)	Explain the pseudocode of wait () and signal () operations of semaphore.	(3)
4)	A)	Consider the following page reference string: 4, 3, 2, 1, 2, 1, 5, 4, 6, 7, 2, 3, 1, 6, 4, 3, 1, 3, 4, 6. How many page faults would occur for the following replacement algorithms, with four-page frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each. i) LRU replacement ii) Second-Chance Algorithm	(4)
	B)	Explain the following two-page replacement techniques. i) Enhanced Second-Chance Algorithm ii) Counting-Based Page Replacement	(3)
	C)	Consider five memory partitions of size 100 KB, 500 KB, 200 KB, 450 KB and 600 KB in same order. If sequence of requests for blocks of size 212 KB, 417 KB, 112 KB and 426 KB in same order come, then which of the following algorithm makes the efficient use of memory?	(3)
5)		Explain the file sharing in i) client-server model and ii) Immutable-Shared-Files Semantics.	(4)
	A)		
	B)	Discuss the goals of protection and principles protection in Operating Systems.	(3)
	C)	Explain any THREE components of the module support under Linux system.	(3)

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