



School of Computer Science and Engineering

Internal Assessment-1														
Course Title: Operating System principles and Programming			USIN <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											
Course Code:22ECSC202			Semester: 4											
Date of Exam: /05/2023			Duration: 75 mins											
Max. Marks : 40														
Note: Answer any two full questions														
Q.No	Questions	Marks	CO	BL	PO	PI Code								
1a	Draw the layered architecture of UNIX in detail. What is the main advantage of layered approach to operating system design and what are the disadvantage of the layered approach Ch1													
1b	Write the syntax for different exec() system calls. <ul style="list-style-type: none"> Write code snippet to demonstrate any exec(). Differentiate between fork() and exec() system calls. 													
1c	Consider two concurrently running processes X and Y as given below. State the order in which these instructions are executed. Shared data semaphore S1=0, S2=0. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Process X</th> <th>Process Y</th> </tr> </thead> <tbody> <tr> <td>do { Instruction A; Signal(S1); Wait(S2); Instruction F; Signal(S1); } While(true);</td> <td>do { Wait(S1); Instruction C; Signal(S2); Wait(S1); Instruction G; } While(true);</td> </tr> </tbody> </table>	Process X	Process Y	do { Instruction A; Signal(S1); Wait(S2); Instruction F; Signal(S1); } While(true);	do { Wait(S1); Instruction C; Signal(S2); Wait(S1); Instruction G; } While(true);									
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2a	How each process is identified? Where the information of each process will be stored. List important and default processes used in OS.																									
2b	Write a C program where parent creates 3 children and termination sequence is as follows: Third child terminated first Second child terminates next First child terminates thirdly Parent terminates in the end																									
2c	What are necessary conditions for critical section problem solution. Explain the hardware solution. What is advantage and disadvantage of the same.																									
3a	Consider the following processes with their arrival time and burst time as given below: <table border="1"><thead><tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th><th>Priority</th></tr></thead><tbody><tr><td>P1</td><td>0</td><td>9</td><td>3</td></tr><tr><td>P2</td><td>2</td><td>7</td><td>1</td></tr><tr><td>P3</td><td>3</td><td>15</td><td>0 (High)</td></tr><tr><td>P4</td><td>6</td><td>3</td><td>2</td></tr></tbody></table> Draw Gantt chart and compute the average waiting time and turnaround time using following algorithms. a Pre-emptive priority b SJF Non pre-emptive Which algorithm yields: <ul style="list-style-type: none">Lowest average waiting time?Lowest average turnaround time?	Process	Arrival Time	Burst Time	Priority	P1	0	9	3	P2	2	7	1	P3	3	15	0 (High)	P4	6	3	2					
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3b	Differentiate between PIPE and FIFO Write a C/C++ program to send variable x from parent to child over a PIPE. Child computes an equation $y=3x+4$.																									