

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

Theory Exam-III, May 2022
BCA, Semester II

Roll No.....

COURSE CODE: CS1120

Time: 2 Hours

Max. Marks: 30

COURSE TITLE: Operating Systems and Linux Administration

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1	Suppose you try to delete a file using the rm command and the deletion fails. What could be the possible reason?	2.5	LO1																																																
Q.2	Explain Process Management System Calls in Linux.	2.5	LO3																																																
Q.3	Consider four processes P1, P2, P3 and P4 with their burst time, arrival time and priorities as shown in the table: <table border="1"><thead><tr><th>Process</th><th>Arrival Time</th><th>Burst Time (in ms)</th><th>Priority</th></tr></thead><tbody><tr><td>P1</td><td>0</td><td>7</td><td>4</td></tr><tr><td>P2</td><td>1</td><td>4</td><td>3</td></tr><tr><td>P3</td><td>3</td><td>3</td><td>1</td></tr><tr><td>P4</td><td>4</td><td>2</td><td>2</td></tr></tbody></table> Assuming that lower priority number means the higher priority, how will these processes be scheduled according to non-preemptive as well as preemptive priority scheduling technique? Compute the average waiting time and average turnaround time in both cases.	Process	Arrival Time	Burst Time (in ms)	Priority	P1	0	7	4	P2	1	4	3	P3	3	3	1	P4	4	2	2	05	LO5																												
Process	Arrival Time	Burst Time (in ms)	Priority																																																
P1	0	7	4																																																
P2	1	4	3																																																
P3	3	3	1																																																
P4	4	2	2																																																
Q.4	What is the readers-writers problem? Give a solution to readers-writers problem using Semaphores.	05	LO6																																																
Q.5	Considering the system with five processes P0 through P4 and three resources types A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t_0 following snapshot of the system has been taken: <table border="1"><thead><tr><th rowspan="2">Process</th><th colspan="3">Allocation</th><th colspan="3">Maximum Allocation</th></tr><tr><th>A</th><th>B</th><th>C</th><th>A</th><th>B</th><th>C</th></tr></thead><tbody><tr><td>P0</td><td>0</td><td>1</td><td>0</td><td>7</td><td>5</td><td>3</td></tr><tr><td>P1</td><td>2</td><td>0</td><td>0</td><td>3</td><td>2</td><td>2</td></tr><tr><td>P2</td><td>3</td><td>0</td><td>2</td><td>9</td><td>0</td><td>2</td></tr><tr><td>P3</td><td>2</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td></tr><tr><td>P4</td><td>0</td><td>0</td><td>2</td><td>4</td><td>3</td><td>3</td></tr></tbody></table> Find out the following with the help of banker's algorithm. (a) What will be the content of need matrix?	Process	Allocation			Maximum Allocation			A	B	C	A	B	C	P0	0	1	0	7	5	3	P1	2	0	0	3	2	2	P2	3	0	2	9	0	2	P3	2	1	1	2	2	2	P4	0	0	2	4	3	3	05	LO7
Process	Allocation			Maximum Allocation																																															
	A	B	C	A	B	C																																													
P0	0	1	0	7	5	3																																													
P1	2	0	0	3	2	2																																													
P2	3	0	2	9	0	2																																													
P3	2	1	1	2	2	2																																													
P4	0	0	2	4	3	3																																													

	(b) Is the system currently safe? If yes, then what is the safe sequence? (c) What will happen if process P1 requests one additional instance of resource type A and two instances of resource type C.		
Q.6	A system uses 3 page frames for storing process pages in main memory. It uses the Least Recently used (LRU) page replacement policy. Assume that all the page frames are initially empty. What is the total number of page faults that will occur while processing the page reference string given below? 4, 7, 6, 1, 7, 6, 1, 2, 7, 2 Also calculate the hit ratio and miss ratio.	05	LO8
Q.7	Define a file system. List the various File Attributes. State and explain commonly used operations on file.	2.5	LO1
Q.8	How does operating system provide protection and security to the system?	2.5	LO4