Department of Computer Science & Engineering
Numerical Question Bank
Operating System (CS-502)
INTRUCTIONS. 1. All questions with their solution are submitted till 27 October 2014.

Q1) Consider the main memory with capacity of 4 pages frames. Assume that the pages of a process are referred in the orders as given below:

1,3,4,4,3,2,1,7,5,6,4,2,1,2

Which one is better FIFO, Optimal, or LRU and why?

Q2) Assume that the following Jobs are to be executed on one processor.

Jobs	Arrival Time	Execution Time
0	5	20
1	8	25
2	9	15
3	11	20
4	15	10

Using SJF Preemptive and Non-Preemptive. Draw Gantt chart and calculate average waiting and turn around time.

Q3) Assume that the following Jobs are to be executed on one processor.

Jobs	Arrival Time	Execution Time	Priority
0	0	80	2
1	10	25	4
2	20	15	3
3	30	20	4
4	40	45	1

Using SJF, Priority, Draw Gantt chart and calculate average waiting and turnaround time.

Q4) Assume that the following Jobs are to be executed on one processor.

Jobs	Arrival Time	Execution Time
0	0	80
1	10	25
2	20	15
3	30	20

4	40	45

Turn around time=15.

Using Round Robin, Priority, Draw Gantt chart and calculate average waiting and turnaround time.

Q5) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
0	10	3
1	1	1
2	2	3
3	1	4
4	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

(i) Draw four Gantt charts il

Q6) Consider the following snapshot of a system.

	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following questions using bankers algorithm

i) What is the content of matrix need.
ii) Is the system in safe state.

Q7) Consider the following snapshot of a system:

Process	Allocation	Max	Available
	A B C D	A B C D	A B 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	

Q9) Describe the Banker's Algorithm for safe allocation. Consider a system with three processes and three resource types and at time to the following snapshot of the system has been taken:

Process	Allocated			Maximum			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
P_1	2	2	3	3	6	8	7	7	10
P_2	2	0	3	4	3	3			
P_3	1	2	4	3	4	4			

(i) Is the current allocation a safe state?
(ii) Would the following requests be granted in the current safe state?
(1) Process p2 requests (1,0).
(2) Process p1 requests (1,0).

Q9) Suppose that disk has 500 cylinders. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending request in FIFO orders is 80, 1470, 913, 1774, 948, 1509, 1022, and 130. What is the total distance that the disk arm moves for the following algorithms?

(i) FCFS
(ii) SSTF
(iii) LOOK
(iv) C-LOOK
(v) SCAN
(vi) C-SCAN

Q10) The queue of pending requests, in FIFO order, is**:** 80, 1470, 913, 1774, 948, 1509, 1022, and 130. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling.

(i) FCFS
(ii) SSTF
(iii) LOOK
(iv) C-LOOK
(v) SCAN
(vi) C-SCAN

Q11) Consider the following reference string:

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the following replacement algorithms, assuming three, five or six frames?

(i) LRU. (ii) Optimal