Northern India Engineering College
Shastri Park, Delhi

Department of Information Technology

Assignment 2 : Operating System (ETCS 212)

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Marks: 05

Instructions:-
- ➢ Last date of submission on or before 28/03/2014
- ➢ Only hand written assignments will be accepted
- ➢ No assignment will be accepted after due date.

Q1.   Differentiate between shared and dedicated devices.
Q2.   Differentiate between deadlock and starvation.
Q3.   What is critical section problem? What are the requirements that a solution to critical section problem must satisfy?
Q4.   What is monitor? How is it used to access critical section?
Q5.   What do you mean by process synchronization? Why is it required?
Q6.   Discuss the deadlock prevention methods in deadlock.
Q7.   What are the techniques for device management?
Q8.   Describe Disk scheduling algorithms.
Q9.   Consider the following snapshot of a system and answer the following question using Banker's Algorithm

Process	Allocation	Maximum	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	

i)   Is the system in safe state?
ii)   Give the sequence of execution.
iii)   If the request from P1 arrives for (0,4,3,2) can the request ne granted immediately.

Q10. Consider the following snapshot of a system. The instances of A, B, C and D are 6, 11, 14 and 16 respectively. Answer the following question using Banker's Algorithm.

Process	Allocation				Maximum			
	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2
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

i) Design a Need matrix
ii) Is the system in safe state?
iii) If the request from P1 arrives for (9, 4, 7, 4) can the request be granted immediately?
iv) Give the final sequence of processes.

Q11. On a disk with 1000 cylinders, number 0 to 999, compute the number of tracks the disk arm must move to satisfy all the requests in the disk queue. Assume the last request serviced was at track 345 and the head is moving toward track 0. The queue in FIFO order contains requests for the following tracks: 123, 847, 692, 475, 105, 376. Perform the computations for the following disk scheduling algorithms:

FCFS
SSTF
SCAN
C-SCAN
LOOK

Q12. Define the following:
i) Buffering
ii) RAID
iii) Direct Memory Access
iv) Resource Allocation Graph
v) Wait & Signal Operation
vi) Semaphores
vii) Race Condition.

Reference:

1. Silbersachatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000.