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V SEMESTER B.E. (CSE) DEGREE END SEMESTER EXAMINATION – November/December 2011
SUBJECT: **OPERATING SYSTEM AND LINUX   (CSE 307)**
(REVISED CREDIT SYSTEM)

Date:

TIME: 3 HOURS   MAX .MARKS : 50

Instructions to Candidates
- Answer **ANY FIVE FULL** questions

1a) Explain with neat diagram the dual mode of operation of operating systems.   3

1b) Explain the virtual machine system model along with its benefits?   3

1c) What are the responsible activities of operating system with respect to memory management   2

1d) Explain the various methods for handling Deadlocks   2

2a) For the following scenario, draw Gantt charts for preemptive priority and pre-emptive SJF. Calculate waiting time and turnaround time for each process and also average waiting time and average turnaround time. Lower the priority value, higher is the process priority   4

Processes	Arrival Time (ms)	Burst Time(ms)	Priority
P1	0	10	1
P2	3	14	0
P3	4	3	2
P4	7	15	0
P5	2	8	3

2b) Differentiate between a Process and a Thread . Discuss the following threading issues to be considered in multithreaded programs:
i) Signal handling
ii) Thread pools
iii) Pthreads   4

2c)Explain the various design options for implementing send and receive message passing primitive   2

3a) Explain the layered structure of operating system. What are the advantages and disadvantages of layered approach?   3

3b) Explain with neat diagram the concept of Process control block and all its information   3

3c) Suppose that a disk drive has 200 cylinders, numbered 0 to 199. The disk head is initially at cylinder 53. The disk queue has the following request for I/O to blocks on cylinders:98, 183, 37, 122, 14, 124, 65, 67. Indicate the total head movement using the following disk scheduling algorithms:
i) SCAN ii) LOOK iii) C-SCAN iv) C-LOOK   **4**

4a) Given memory partitions of 100KB, 500KB, 200KB, 300KB, 600KB (in order), how would each of the first fit, best fit and worst fit algorithms place processes of 212KB, 417KB,112KB and 426KB (in order). Which algorithm makes the most efficient use of memory?   3
4b) Explain the following with neat diagram   4
  i.   Hashed Page Table
  ii. Inverted Page Table
4c) Consider the following page reference string:
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6, 4,3,2,5,3,7,1
How many page faults would occur for the LRU and OPTIMAL page replacement algorithms, assuming there are 3 page frames ?   3
5a) For the table given in Table Q5.a following use Banker's Algorithm

Processes	Allocation A B C D	Max A B C D	Available A B C D
P1	0 0 1 2	0 0 1 2	1 5 2 0
P2	1 0 0 0	1 7 5 0	
P3	1 3 5 4	2 3 5 6	
P4	0 6 3 2	0 6 5 2	
P5	0 0 1 4	0 6 5 6	

Fig:Table Q5.a
i)Write the content of the matrix Need?
ii)Is the system safe?
iii)If the request from a process P2 arrives for (0,4,2,0) can the request be granted immediately. If possible what will be the sequence of process execution?   5
5b)Explain Access matrix with owner rights   3

5c) Show that if the wait() and signal() semaphore operations are not executed atomically, then mutual exclusion may be violated   2
6a). Why are monitors used? Show how you obtain deadlock free solution to the dining-philosopher's problem using monitors   4
6b)Explain memory management with respect to Linux   3
6c)What is virus? Define different category of viruses   3