T.E. (Com) Sem VI (R) 2/6/09

May 09 HP 98
Con. 3091-09. Operating Systems with Unix VR-5328

(REVISED COURSE)

(216) 3 p.m. to 6 p.m.

(3 Hours) [Total Marks 100

N.B. : (1) Question No. **1** is **compulsory**.
(2) Assume suitable data wherever **necessary.**
(3) Attempt any **four** questions from remaining.

1. (a) How will the nine protection bits look for the following cases : 5
   (i) Project group students Sunil and Anil want to share their files for development work.
   (ii) A faculty member wants his Notes to be public for reading.
   (b) Show using suitable diagram a multiprocess scenario and a multithreaded scenario with respect to code, data, files, state and registers. 5
   (c) Differentiate between Internal and External fragmentation. 5
   (d) Given memory partition of 100 kB, 500 kB, 200 kB, 600 kB and 300 kB, show how the First fit and Best fit algorithm will place processes of 212 kB, 417 kB, 112 kB. Which algorithm is more efficient ? 5

2. (a) Consider following set of processes with the length of CPU burst time given in milliseconds. 12

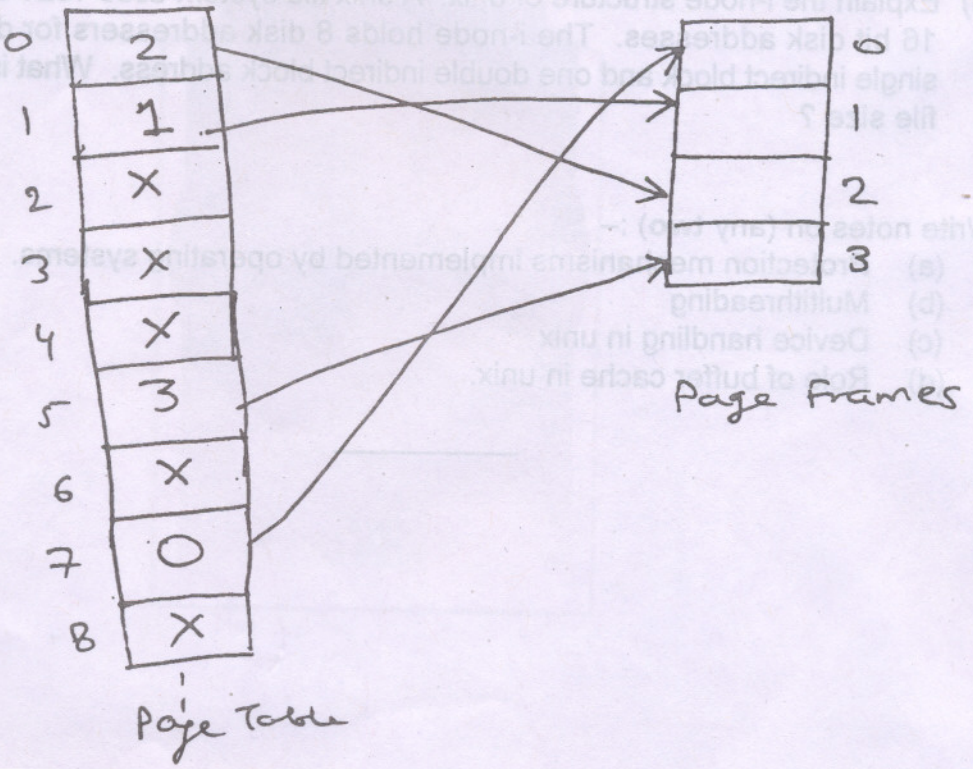
Process	Burst Time	Priority
P 1	10	3
P2	01	1
P3	02	3
P4	01	4
P5	05	2

The processes are assumed to have arrived in order P1, P2, P3, P4, P5 all at time 0.
Draw three Time Lines illustrating the execution of these processes using following :
(i) SJF
(ii) A non preemptive priority a small priority number implies higher priority
(iii) Round Robin with quantum time = 1 ms.
Also calculate average turn around time for each.

(b) Explain multilevel feedback queue algorithm for process scheduling. 8

3. (a) Using the page table shown in the **figure 1** and a page size of 4 K, give physical address for each of the following virtual addresses : 20, 4096, 28674, 9216 **8**

Figure 1



(b) Explain LRU page replacement Algorithm. A system has four Page frames. The time of loading, Last access time and R and M bits for each page are as follows : 12

Page	Loaded	Last ref.	R	M
0	126	279	0	0
1	230	260	1	0
2	120	272	1	1
3	160	280	1	1

(i) Which Page will FIFO replace ?
(ii) Which Page will LRU replace ?
(iii) Which Page will NRU replace

4. (a) Explain all necessary conditions for deadlock prevention. 10
(b) Consider following snap shot of a system. 10

Process	Resource Allocated				Max Required				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				

5. (a) What are the various mechanisms implemented by operating system for allowing file sharing ? 10
(b) How does a typical directory entry looks in unix operating system ? Show the steps (using suitable diagrams) in looking up following file : 10
/usr/mydir/mymail

6. (a) What are the various parameters that are considered by disk scheduling algorithms ? Explain the SCAN Scheduliy. 10
(b) Explain the i-node structure of unix. A unix file system uses 1024-byte blocks and 16 bit disk addresses. The i-node holds 8 disk addressers for data block, one single indirect block and one double indirect block address. What is the maximum file size ? 10

7. Write notes on (any **two**) :– 20
(a) Protection mechanisms implemented by operating systems.
(b) Multithreading
(c) Device handling in unix
(d) Role of buffer cache in unix.