DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VI [INFORMATION TECHNOLOGY]
SUBJECT: (IT 607) Applied Operating System

Examination	**: Third Sessional**	**Seat No.**	**:**
Date	**: 26/03/2014**	**Day**	**: Wednesday**
Time	**: 12:45 to 2:00**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) What are major disadvantages of directory implementation using *Linear List*? **[2]**

(b) Write major advantages and disadvantages of Access Control implementation in Microsoft Windows OS and Linux OS. **[2]**

(c) Write in brief about Acyclic-Graph Directories structure. **[2]**

(d) Discuss Copy-on-Write Concept. Which system call of Unix OS uses it? **[2]**

(e) Which property is required by any page replacement algorithm if it doesn't suffer with Belady's Anamoly? **[2]**

(f) Discuss Advantages and Disadvantages of Global and Local Frame allocation algorithms. **[2]**

Q.2 Attempt ***Any TWO*** of the following questions. **[12]**

(a) Draw and Discuss Contiguous block allocation method and Indexed block allocation method related to file system implementation. Also discuss their major advantages and disadvantages. **[6]**

(b) Consider the following snap shot of a system.
Total resources in a system are (R1,R2,R3,R4)=(6,7,12,12). Current Allocation: (0,0,1,2) for process P1, (2,0,0,0) for process P2, (0,0,3,4) for process P3, (2,3,5,4) for process P4 and (0,3,3,2) for process P5. Max. resource requirement: (0,0,1,2) for process P1, (2,7,5,0) for process P2, (6,6,5,6) for process P3, (4,3,5,6) for process P4 and (0,6,5,2) for process P5.
Answer following questions using Banker's Algorithm. Show the calculations also.
(i) Calculate available resource matrix and need matrix for the above state. **[1]**
(ii) Determine safety if it exists for the current state of the system. **[2.5]**
(iii) P3 requests for (0,1,0,0). Does this request lead to a deadlock? **[2.5]**

(c) Discuss "Recovery from Deadlock" **[6]**

Q.3 (a) Assume that we have a demand-paged memory. The page table is held in registers. It takes 8 milliseconds to service a page fault if an empty frame is available or if the replaced page is not modified and 20 milliseconds if the replaced page is modified. Memory-access time is 100 nanoseconds. Assume that the page to be replaced is modified 70 percent of the time. What is the maximum acceptable page-fault rate for an effective access time of no more than 200 nanoseconds? **[6]**

(b) Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is **[6]**
86,1470, 913, 1774, 948, 1509, 1022, 1750, 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 algorithms?
(1) SSTF (2) C-SCAN

OR

Q.3 (a) Calculate number of page faults for following page reference string for **[6]**
(A)MFU (B) LFU (C) Optimal page replacement policies.
Page reference string : 1,2,3,4,1,2,5,1,2,3,4,5
No of page frame : 3

(b) (1) What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system to eliminate this problem? **[4]**

(2) Discuss Second Chance Page Replacement Algorithm. **[2]**