DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
THIRD SESSIONAL
SUBJECT: (IT 607) Applied Operating System

Examination	**: B.TECH Semester - VI**	**Seat No.**	**:**
Date	**: 30-03-2013**	**Day**	**:Saturday**
Time	**: 12:00 to 1:15**	**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) Assume disk rotates at 14400 RPM. What is the average rotational latency of this disk drive? **[2]**

(b) If we take some page reference string and then Find number of page faults and then if we take reverse of that page reference string then find number of page faults then in which page replacement policies both cases gives same result? **[2]**
(A) Optimal Page Replacement Policy
(B) LRU Page Replacement Policy
(C) FIFO Page replacement Policy
(D) All of the above
(E) None of the above

(c) Assume a page reference string for a process with '**m**' frames (initially all empty). The Page reference string has length '**p**' with '**n**' distinct page numbers occurring in it. For any page-replacement algorithms, **[2]**
a. What is a lower bound on the number of page faults?
b. What is an upper bound on the number of page faults?

(d) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. **[2]**
a. How many bits are there in the logical address?
b. How many bits are there in the physical address?

(e) Consider a paging system with the page table stored in memory. **[2]**
a. If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?
b. If we add associative registers, and 75 percent of all page-table references are found In the associative registers, what is the effective memory reference time? (Assume that finding a page-table entry in the associative registers takes zero time, if the entry Is there.)

(f) Consider the following segment table: **[2]**

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?

	Segment	Offset
a.	0	430
b.	1	10
c.	2	500
d.	3	400
e.	4	112

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

(a) Discuss any two file allocation Method.

(b) What is demand paging? Write down steps to handle page faults. How to measure performance of demand paging?

(c) Suppose that a disk drive has 5000 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
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?
a. SSTF
b. SCAN

Q.3 (a) Discuss Hash page table and shared page table techniques. **[6]**

(b) Discuss Second chance and Enhanced second chance page replacement policies. **[6]**

OR

Q.3 (a) Calculate number of page faults for following page reference string for **[6]**
(A)FIFO (B) LRU (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) Discuss internal and external fragmentation. Suppose that a total of 128 MB RAM is available **[6]** in system. This memory space is partitioned into 8 fixed sized slots of 16 MB each. Assume 8 processes are currently requesting memory usage with sizes indicated as follows[2 MB, 4 MB, 3 MB, 7 MB, 12 MB, 18 MB, 5 MB, 16 MB] calculated the size of memory wasted due to external and internal fragmentation. Assume exactly one slot can be given to each process.