

Quiz 10

Course: cs241 - System Programming, CS Department

Date: April 21, 2006

Netid:

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Note: Completion of quiz is an individual effort. The quiz takes 10 minutes. The student gets additional 5 points for taking the quiz. *Each question has ONLY ONE ANSWER!!!*

1. (1 Point) Which of the following types of binding takes place during runtime?
 - a. Symbolic names to virtual addresses
 - b. Virtual to physical addresses
 - c. Both (a) and (b)

2. (1 Points) Suppose the paging hardware with TLB has a 90 percent hit ratio. Page numbers found in the TLB have a **total access time** of 100 nanoseconds. Those which are not found there have a **total access time** of 200 nanoseconds. What is the **effective access time**?
 - a. 100 nanoseconds
 - b. 110 nanoseconds
 - c. 190 nanoseconds
 - d. 200 nanoseconds

3. (1 Point) If the page table is broken up into pages, with an outer page-table to select the correct inner table, we are using
 - a. paged swapping
 - b. inverted page table
 - c. multi-level paging
 - d. none of the above

4. (1 Point) The total space required for an inverted page table is proportional to the number of
 - a. pages in the virtual memory
 - b. pages * holes
 - c. pages + overlays
 - d. page frames in the physical memory
 - e. none of the above

5. (1 Point) A system that uses a paging virtual memory system will suffer from
 - a. external fragmentation
 - b. internal fragmentation

6. (1 Point) Least Recently Used (LRU) Page Replacement Algorithm bases its decisions to evict a page on
 - a. future references
 - b. past references that are organized via a stack structure
 - c. references that have clean bit

7. (1 Point) Consider a reference string ACDB, where Page A was referenced first, then Page C was referenced in the next cycle, then other actions occurred (e.g., reading, writing, updating bits), then Page D was referenced, and Page B was referenced last. Consider for the given reference string the resulting reference bit (R) and modified bit (M) for each page as follows: $R_A = 0$, $R_C = 0$, $R_D = 1$, $R_B = 1$, and the modified bit $M_A = 1$, $M_C = 0$, $M_D = 1$, $M_B = 0$. Which page out of the given reference string would be the most appropriate to evict?
 - a. Page A
 - b. Page C
 - c. Page D
 - d. Page B

8. (1 Point) Which page replacement suffers from Belady anomaly?
 - a. Least Recently Used
 - b. FIFO
 - c. Second Chance

9. (1 Point) Once the system detects thrashing, what can the system do to eliminate this problem?
 - a. Increase the number of CPU-bound jobs
 - b. Decrease the degree of multiprogramming
 - c. Install faster CPU
 - d. None of the above

10. (1 Point) In the paging virtual memory management system, let us consider program B with 10 pages. Each page is $16=2^4$ bytes, and the variable b in program B has the logical address 162. What is the virtual address of b in the representation of (p,d) , where p is the page number and d is the page offset?
 - a. (10,4)
 - b. (10,2)
 - c. (16,2)
 - d. (11,2)
 - e. invalid address