Question 3

It takes 250ns to fetch the entry from page table and another 250ns to access the location of the memory location.

Paged memory reference = 2 x 250 = 500ns.

TLB hit: if the entry is found on the TLB we add 30ns to the memory access time.

TLB miss: if the entry is not found, we would have to add another 250ns to grab the entry into the TLB

EAT equation:

TLB hit\*80% + TLB Miss\* 20%

(250+30)\*0.8 + (500+30)\*0.2=330ns

Question 4

a)

Every page can hold (2^11 ) 11 bits to address the 2048 address, and since the number of pages is 32, 5bits are used for the page number.

b)

Length= 32 row/page long

Width=20-11 = 9 bits

c)

20^2 /2 = 2^19 => so the width table = 19-11 = 8 bits

Question 5

a)

A race occurs when a **Threads** or a **Process** try to access the same variable or same place in memory simultaneously.

One example of that is while doing the programming part of this assignment, the DBserver and the DBeditor might both try to access the database (all the clients) tryn edit the information of the client at a single time.

b)

If we disable the interrupts, all the I/O will be paused and would have to wait.If we prevent the interrupt when a shared memory/variable is being accessed/modified, this assures that no other instruction will change the variable at this time.

Question 6

Semaphore are thought about as a lock that prevent a **THREAD/PROCESS** form accessing/modifying a shared variable simultaneously. The function wait() will make the **THREAD/PROCESS** wait until the resource is available, and the function signal() will be used by the **THREAD/PROCESS**  after finishing from using a shared resource to inform whoever is waiting for the resource that it is free now.

Question 7

A call to open () creates a new open file description, an entry in the

System-wide table of open files. The open file description records the file offset and the file status flags.

A file opened or append, this will write info to the end of the file and the pointer will point to the end of the file.

Question 8

12 disk blocks : 12 x 8 KB

1 indirect disk block : 20481 x 8 KB

Double indirect disk block : 20482 x 8 KB

Triple indirect disk block : 20483 x 8 KB

Total = 68 753 047 648 KB

b) We would have to double the block size in order to store a file larger than the file computed.