Question 1:
A.) With 2KB pages, $\log_2(2048) = 11$ bit page offset. The 24 bit physical addresses minus page offset leaves 13 bits of PPN. The 27 bit virtual addresses minus page offset leaves 16 bits of VPN.

B.) Removing page offset from address 0x20301dc gives 0x4060, and from address 0x2040150 gives 0x4080, indicating they are on different pages. With two second level page tables having 256 entries of 8 bytes, each page table $= 256 \times 8 = 2048$ bytes. Total $=$ first level $+$ 2(second level) $= 2048 + 4096 = 6144$ bytes $= 6$ KB.

C.) Due to page table offset, the maximum index bits available $= 11$. Index bits for sets $=$ total index - $\log_2$(associativity) $= 11 - \log_2(4) = 9$ bits. $2^9 = 512$ sets each with 4-way associativity is the largest VIPT cache size that can be supported before data is aliased because the index cannot be stored in the page table offset which is accessible to physical and virtual addresses.

Question 2:
A.) Base and bound has faster access to memory than a page based system so it is more applicable to real time systems where predictability and speed of memory accesses is necessary for performance needs, or smaller embedded systems that are limited in memory.