Answer to Question 1:

i. **Divide the virtual address into two parts:**
   - Virtual Page Number (VPN): The upper bits of the address, identifying the page.
   - Offset: The lower bits of the address, identifying the byte within that page.
   - Since the page size is 1024 bytes, the offset is the lower 10 bits of the address.

ii. **Look up the VPN in the page table:**
   - If the valid bit is 1, the page is currently loaded into physical memory.
   - The Page Frame Number (PFN) from the table indicates the frame in physical memory that holds this page.

iii. **Calculate the physical address:**
   - Physical Address = (PFN × Page Size) + Offset

If the valid bit is 0, this results in a page fault, and the operating system must load the page from disk into memory.

Answer to Question 2:

a) Virtual address: 1052
- VPN = 1052 ÷ 1024 = 1, Offset = 1052 mod 1024 = 28
- From the page table: VPN 1 → Valid = 1, PFN = 7
- Physical address = 7 × 1024 + 28 = 7196

Answer: 7196

b) Virtual address: 2221
- VPN = 2221 ÷ 1024 = 2, Offset = 2221 mod 1024 = 173
- From the page table: VPN 2 → Valid = 0

Answer: Page fault (no physical address, page is not in memory)

c) Virtual address: 5499
- VPN = 5499 ÷ 1024 = 5, Offset = 5499 mod 1024 = 379
- From the page table: VPN 5 → Valid = 1, PFN = 0
- Physical address = 0 × 1024 + 379 = 379

Answer: 379