Question 1

The following is a sequence of word addresses: 1, 4, 7, 8, 22, 18, 20, 52, 11, 8, 34, 7, 37, 1, 8, 18. Show whether a read to each of these addresses is a hit or miss for each of the following cases. Assume that cache is initially empty. Show the final contents of the cache.

(i) Direct mapped cache with 16 one-word blocks.
(ii) Direct mapped cache with 4 four-word blocks. The total size is 16 words; 4 words are loaded at once.
(iii) Two-way associative cache with 16 one-word blocks. Assume Least Recently Used (LRU) replacement.
(iv) Fully associative cache with 16 one-word blocks. Assume LRU replacement.
(v) Fully associative cache with 4 four-word blocks. Assume LRU replacement.