

1. There are several factors that affect the efficiency of lookup operations in a hash table. Which of the following factors affect the efficiency of the hash lookups?

- (i) Number of elements stored in the hash table
  - (ii) Number of buckets in the hash table
  - (iii) Quality of the hash function
- A. both (ii) and (iii) are correct, and (i) is incorrect  
 B. only (ii) is correct  
 C. only (iii) is correct  
 D. **Your Answer** Only (i) is correct  
 E. **Correct Answer** All (i) (ii) and (iii) are correct

2. Given a hash table  $T$  that can store 80 elements and has 100 slots, the load factor  $\alpha$  for  $T$  is:

- A. None of the other options are correct.  
 B. 0.125  
 C. 8000  
 D. **Correct Answer** **Your Answer** 0.8  
 E. 12.5

3. Which of the following statement(s) are correct about collision?

- i) Two entries are identical except for their keys.
  - ii) Two entries with different data have the exact same key.
  - iii) Two entries with different keys have the same exact hash value.
  - iv) Two entries with the exact same key have different hash values.
- A. i and iii only  
 B. i only  
 C. ii and iii only  
 D. iV only  
 E. **Correct Answer** **Your Answer** iii only

4. The CS department wants to maintain a database of up to 1800 UINs of students who have taken CS 225 so that it can be determined very quickly whether or not a given student has taken the course. Efficient use of memory and speed of response are equally important. Which of the following data structures would be most appropriate for this task?

- A. A sorted array with 1800 entries  
 B. **Your Answer** A hash table using probing with capacity 1800  
 C. A sorted linked list  
 D. **Correct Answer** A hash table using probing with capacity 4500  
 E. A hash table using probing with capacity 1000

5. A hash table of length 10 uses open addressing with hash function  $h(k) = k \bmod 10$ , and linear probing

0	1	2	3	4	5	6	7	8	9
		42	23	34	52	46	33		

After inserting 6 values into an empty hash table, the table is as shown below. Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- A. **Correct Answer** **Your Answer** 46, 34, 42, 23, 52, 33  
 B. 46, 42, 34, 52, 23, 33  
 C. None of the options is correct  
 D. 42, 46, 33, 23, 34, 52  
 E. 34, 42, 23, 52, 33, 46