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1. Given a hash table ${\tt T}$ that can store 3000 elements and has 15 slots, the load factor alpha for ${\tt T}$ is:

- A. 400
- B. [Correct Answer] [Your Answer] 200
- C. None of the other options are correct.
- D. 0.05
- E. 0.025

2. A hash table of length 10 uses open addressing with hash function h (k) = k mod 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. None of the options is correct
- **B**. 42, 46, 33, 23, 34, 52
- C. [Correct Answer] [Your Answer] 46, 34, 42, 23, 52, 33
- D. 34, 42, 23, 52, 33, 46
- E. 46, 42, 34, 52, 23, 33

3. 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. Speed of response is very important; efficient use of memory is not required. Which of the following data structures would be most appropriate for this task?

- A. A sorted linked list
- B. A sorted array with 1800 entries
- C. A hash table using probing with capacity 4500
- D. A hash table using probing with capacity 1800
- E. [Correct Answer] [Your Answer] A hash table using probing with capacity 100000
- 4. Which of the following statement(s) is TRUE?
- (i) A hash function takes a message of arbitrary length and generates a fixed length code.
- (ii) A hash function takes a message of fixed length and generates a code of variable length.
- (iii) A hash function may give the same hash value for distinct messages.
 - A. None of the above options are correct.
 - B. i only
 - C. [Correct Answer] [Your Answer] i and iii only
 - D. ii and iii only
 - E. ii only

5. A hash table of size n stores n data items. Which of the following collision resolution strategies minimizes the worst case time complexity of the find operation?

- A. Open addressing with double hashing
- B. Separate chaining
- C. Open addressing with linear probing
- D. Your Answer Open addressing with either linear probing or double hashing as both are equally efficient in this case
- E. [Correct Answer] All collision resolution algorithms give the same worst case time complexity for the find operation