

Q1 Academic Honesty

1 Point

It is a violation of the Academic Integrity Code to look at any reference material other than your textbook and lecture notes, or to give inappropriate help to someone or to receive unauthorized aid by someone in person or electronically via messaging apps such as WhatsApp. Academic Integrity is expected of all students of Hacettepe University at all times, whether in the presence or absence of members of the faculty. Do NOT sign nor take this exam if you do not agree with the honor code.

Understanding this, I declare I shall not give, use or receive unauthorized aid in this examination.

Signature (Specify your name and surname as your signature)

Mehmet Taha USTA MTUSTA

Q2

20 Points

Given a hash table of length 10 below which uses open addressing and linear probing with hash function $h(k) = k \bmod 10$. After inserting 6 values into an empty hash table, the table is as shown below.

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

Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- ☐ 46, 42, 34, 52, 23, 33
- ☐ 34, 42, 23, 52, 33, 46
- ☒ 46, 34, 42, 23, 52, 33
- ☐ 42, 46, 33, 23, 34, 52

Q3

20 Points

Let H be a hash-table where collisions are handled by separate chaining and where re-hashing is used each time the load factor (number of items in the table divided by the size of the table) exceeds $\frac{1}{2}$. We assume that the initial size of H is 2 and that re-hashing doubles the size of the table. After inserting 10 items with different keys, what is the size of the hash-table H ?

32

Q4

19 Points

Given an undirected graph G with V vertices and E edges, the sum of the degrees of all vertices is

- ☐ E
- ☒ $2E$
- ☐ V
- ☐ $2V$

Q5

20 Points

What is the number of edges in a tree of n vertices?

- ☐ n
- ☒ $n - 1$
- ☐ $n(n - 1)/2$
- ☐ n^2

Q6

20 Points

Select the ones that are true. (No partial credit)

☐ Every rooted tree is a DAG☒ DAG is a rooted directed tree☒ A tree is an undirected connected graph☐ Adjacency list representation of a graph has $O(|V|^2)$ space complexity☒ It is faster to find vertex degree using the adjacency list compared to using the adjacency matrix.

Quiz 5

● GRADED

STUDENT

MEHMET TAHA USTA

TOTAL POINTS

80 / 100 pts

QUESTION 1

Academic Honesty

1 / 1 pt

QUESTION 2	
(no title)	20 / 20 pts
QUESTION 3	
(no title)	20 / 20 pts
QUESTION 4	
(no title)	19 / 19 pts
QUESTION 5	
(no title)	20 / 20 pts
QUESTION 6	
(no title)	0 / 20 pts