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

While answering the following questions, please consider the implementations that we discussed in our lectures unless stated otherwise.

Q2 Recursion

20 Points

```
int function1(int a, int b) {
  int g;
  if (b == 0)
    g = a;
  else
    g = function1(b,a/b);
  return g;
}
```

What is the output of

```
function1(56,14)
```

3

Q3 Tilde Notation

25 Points

How many array accesses does the following code fragment have as a function of n?

```
int count = 0;
for (int i=0; i<n; i++)
  for (int j=0; j<n; j++)
    for (int k=1; k<n; k = k*2)
      if (a[i]+a[j] >= a[k])
        count++;
```

- ○ $\sim 3\, n^3$
- ◉ $\sim \frac{3}{2} n^2\, lg\, n$
- ○ $\sim 3\, n^2\, lg\, n$
- ○ $\sim 3n^2$
- ○ None of above

Q4 True/False

4 Points

Best-case analysis always gives a smaller bound on the cost compared to the worst-case analysis.

- ◉ True
- ○ False

Q5 Complexity Analysis: Big-O

50 Points

Find the big-O time complexity of each of the following code fragments.

Q5.1

25 Points

```
int i = 1;
while (i <= n) {
   print("*");
   i = 2 * i;
}
```

- (●) $O(lg\, n)$
- ( ) $O(n)$
- ( ) $O(n\, lg\, n)$
- ( ) $O(n^2)$

Q5.2

25 Points

```
int i = 0;
while (i < n) {
   print("*");
   i = i + 2;
}
```

- ( ) $O(lg\, n)$
- (●) $O(\frac{n}{2})$
- ( ) $O(n)$
- ( ) $O(n^2)$

Quiz 1

GRADED

STUDENT

MEHMET TAHA USTA

TOTAL POINTS

46 / 100 pts

QUESTION 1

Academic Honesty **1** / 1 pt

QUESTION 2

Recursion **20** / 20 pts

QUESTION 3

Tilde Notation **0** / 25 pts

QUESTION 4

True/False **0** / 4 pts

QUESTION 5

Complexity Analysis: Big-O **25** / 50 pts

5.1 (no title) **25** / 25 pts

5.2 (no title) **0** / 25 pts