

Student ID: \_\_\_\_\_

# CS 151 Quiz 1

Name : \_\_\_\_\_ , \_\_\_\_\_  
(Last Name) (First Name)

Student ID : \_\_\_\_\_

Signature : \_\_\_\_\_

## **Instructions:**

1. Please verify that your paper contains **5 pages** including this cover.
2. Write down your Student-Id on the top of each page of this quiz.
3. This exam is **closed book**. No notes or other materials are permitted.
4. Total credits of this quiz are **25 points**.
5. To receive full credits, you must show your work clearly.
6. **No re-grades will be entertained if you use a pencil.**
7. Calculators are **NOT** allowed.

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**Q1: [Data Conversion]**

**[6 points]**

**(a)- Convert the following decimal number to binary using divide-by-2 method: (3 points)**

**97**

**(b)- Convert the following hexadecimal number to octal: (3 points)**

**F2E**

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**Q2: [Boolean algebra]**

**[8 points]**

**Prove the following Boolean equation using Boolean algebra:**

$$\mathbf{a.(a + b + c').(a' + b' + c).(a + b + c).(a' + b' + c') = a.b'}$$

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**Q3: [Combinational Logic Design]**

**[8 points]**

**A comparator has two inputs  $A = a_1a_0$  and  $B = b_1b_0$  and one output  $F$ . Output  $F$  becomes one whenever the value of input  $A$  is greater than or equal to the value of input  $B$ . Using truth table write the equation for output  $F$ .**

**You are NOT needed to simplify the function.**

**NOTE: The truth table has 4 inputs and one output.**

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**Q4: [Combinational Circuit]**

**[3 points]**

Write the equation for function F in the circuit shown below.

