**Quiz - 5**

**Course:** [Theory of Automata (CS) NC](https://ucaelearning.org/course/view.php?id=254)  **Time: 30 Min**

**Student Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Convert the Following CFGs to CNFs**

1. **S 🡪 a X a**

**X 🡪 a X**

**X 🡪 b X**

**X🡪 ^**

1. **S 🡪 a X b X**

**X🡪 a X**

**X🡪 b X**

**X🡪 ^**

1. **S🡪 aa**

**S🡪 ab**

**S🡪 ba**

**S🡪bb**

1. **S🡪 XYX**

**X🡪 a**

**Y🡪b**

**Bonus**

**S**🡪 **XbXaXb**

**X**🡪 **aX**

**X** 🡪 **bX**

**X**🡪 **^**