UNITED INTERNATIONAL UNIVERSITY
Department of Computer Science and Engineering (CSE)

Course Title: Theory of Computation **Course Code: CSE 2233** **Credit Hours: 3.0**

Trimester & Year: Fall 2021 **Section: A** **AZ**

CT-04

Total Marks: 20 Time: **45** min

In the Question the value of x and y will be as follows and you must write on the first page of your answer script clearly:

x = [{(last digit of your ID number + 1) * 8} % 3] + 1

y = [{(last digit of your ID number + 1) * 5} % 4] + 1

1. Construct Pushdown Automata (PDA) that recognizes following languages **5+5**

(a) $L = \{ a^i b^{2j} c^k \mid i,j,k \geq 0 \text{ and } i=j \text{ or } i=k\}$

(b) $L = \{ 1^{2n}0^{xn} \cup 0^{yn}1^{3n} \mid n \geq 0\}$

2. Construct Pushdown Automata (PDA) that recognizes following language and show a PDA tree traversal of the input **xyy#yyx** to determine it's acceptability. **5**

$$L = \{ W\#W^R \mid W \in \{x,y\} \}$$

3. Draw the state diagram of TM for deciding the following Language and show a tape traversal of the input **yz#yx** to determine it's acceptability. **5**

$$L = \{ W\#W \mid W \in \{x,y,z\} \text{ where } z = y+2\}$$