**National University of Computer & Emerging Sciences, Karachi  
Fall-2020 CS-Department**Fast

**Assignment 4**

**Deadline 13 May 2021 11:55 pm**

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| **Course Code: CS301** | **Course Name: Theory of Automata** |

**Question 1:**

**Construct an equivalent P.D.A. from following CFG:**

**S ->aTb| b**

**T ->Ta | ɛ**

**Trace the input sring "aaab" using stack.**

**Question 2:** **P.D.A.**

**Construct an equivalent P.D.A. by empty stack, from following CFG:**

**S->0TT**

**T->0S|1S|0**

**Trace the input string belongs to language using stack.**

**Question 3:**

**Consider b}, the start variable is S, and the rules R are the following CFG G = (V, Σ, R, S), where V = {S, T, X}, Σ = {a,**

**S → aT Xb**

**T → XT S | ε**

**X → a | b**

**Convert G to an equivalent PDA**

**Question 4:**

**Define what one might mean by properly nested parenthesis structures involving two kinds of parentheses, say () and []. Intuitively, properly nested strings in this situation are ([]), ([[]])[()], but not ([)] or ((]]. Using your definition. Construct the PDA for accepting all properly nested parentheses.**

**Question 5:**

**Construct the PDA of the language.**

**1. L= {w|w∈ 0n1n+1 | n≥0}**

**2. L = { a2nb3n| n ≥ 0 }**

**3. L ={ a4bn cn|n>0}**

**4. L={ a4nbn cn|n>0}**

**5. L={ am bn cn dm |m,n>0}**

**6. L={ an bn cm dm |m,n>0}**

**7. L1 ={ aibj | 2j≥i}**

**8. L2 ={ an bm cp | n=m+p}**