Assignment (Spring 2024)

**United** International **University (UIU)**

**Dept. of Computer Science & Engineering (CSE)**

#### CSE 2233/CSI 233: Theory of Computation/Theory of Computing

(Total Marks : 5 )

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| **1.** | Design Context-Free Grammar (CFG) for the following languages.  L1 = {Strings with equal number of a’s and b’s (in any order)}  L2 = {Strings not of the form 0i 1j ,where, i = j ; i,j ⪄ 0 }  L3 = { an b2m | n ≥ 1, m ≥ n }  L4 = { an bm | n ≤ m ≤ 2n } |
| **2.** | Convert the following **Context Free Grammar**’s (CFG) into **Chomsky Normal Form** (CNF):   |  |  | | --- | --- | |  |  | |  |  | |
| **3.** | Design a **Push-Down Automata** for each one of the following languages:  L1 = { an+m bm+t at bn | n,t >0 and m>=0 } , ∑ = { a,b }  L2 = { a2n+1 bn | n > 0 } , ∑ = { a,b }  L3 = { 0i 1j | i ≤ j ≤ 2i } , ∑ = { 0,1 }  L4 = { ap bq c2r | p ≠ q ; p,q,r ≥ 0 } |