United International University (UIU)

Dept. of Computer Science & Engineering (CSE)
CSE-2233, Theory of Computation - Class Test-4 (F,G)
Time : 35 minutes   (SET-1)

1. Convert the following *CFG* to *Chomsky Normal Form (CNF):*   **3**

$$S \rightarrow DBC \mid Ba$$
$$B \rightarrow 0B1 \mid 01 \mid \varepsilon$$
$$C \rightarrow aCb \mid ac \mid Bb$$
$$D \rightarrow bD \mid D$$

2. Construct a *Push Down Automata (PDA)* for the following languages: **3+4**

   a) $L = \{ a^{3n} \% b^{2n} \mid n \geq 1 \}$ where, $\sum = \{a, b, \%\}$

   b) $L = \{ 0^m 1^n 2^k \mid m, n, k \geq 1, \text{ where } m=k \text{ or } n=m \}$