United International University (UIU)

Dept. of Computer Science & Engineering (CSE)
CSE-2233, Theory of Computation - Class Test-3 (F,G)
Time : 30 minutes (SET-2)

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1. Construct a **CFG** that generates the following languages: **2+2**

i) $L = \{ a^{4n}\ b^{2m}\ c^{k+2} \mid m = \frac{k}{3} \text{ and } n \geq 0 , m>0\}$

ii) L = {w is consisted of {0,1} | w is **even** and **mid symbol** is **01**}

2. Consider the following **context-free grammar** (CFG) and answer the questions that follows: **3**

$$E \rightarrow E + E \mid A \mid F$$

$$S \rightarrow 0E44 \mid 0A \mid 0S$$

$$A \rightarrow 5A7 \mid 2S3 \mid 0S4 \mid \varepsilon$$

$$F \rightarrow \varepsilon \mid 5 \mid (5)$$

Perform **Leftmost derivation** using the grammar for the string: **2003+00444**

3. Consider the following ***context-free grammars (CFG):*** **3**

$$S \rightarrow AS \mid BAC$$
$$A \rightarrow A1 \mid 0A1 \mid 0B1 \mid B$$
$$B \rightarrow 0B \mid 0 \mid €$$
$$C \rightarrow 1 \mid €$$

With the help of **Top-Down Parse tree** decide whether the grammar is **Ambiguous** or not for the following string: **00011111**