THEORY OF COMPUTATION - Integrated M.Tech II

Assignment - 2 **Submit by March 28th, 2018**

- Take the alphabet as $\{a, b\}$ if not specified.
- Find a context-free grammar generating the given language. Explain the logic behind each rule.
- Construct a Push-down Automaton that recognizes the language
- Trace your CFG as well as PDA on a typical and atypical example.

16MCME01

$$\{a^i b^j c^k : j = i \text{ or } j = k,\ i, j, k \geq 0\}$$

16MCME02

$$\{a^n b^n \cup a^n b^{2n} : n \geq 0\}$$

16MCME03

$$\{a^i b^j : i \leq 2j,\ i, j \geq 0\}$$

16MCME04

$$\{a^i b^j c^k : i < j \text{ or } i > k,\ i, j, k \geq 0\}$$

16MCME09

$$\{a^i b^j : i/2 \leq j \leq 3i/2,\ i, j \geq 0\}$$

16MCME10

$$\{a^i b^j c^k : i \neq j + k\}$$

16MCME11

$$\{a^i b^j c^k : j = i + k,\ i, j, k \geq 0\}$$

16MCME13

$$\{w \in \{a, b\}^* : n_a(w) = 2n_b w\}$$

16MCME14 $\{w\#x | w^R$ is a substring of x; w, $x \in \{a, b\}^*\}$

16MCME15

$$\{a^i b^j c^k : j \neq i + k\}$$