

**M.G.M.’S College of Engineering, Nanded.**

**Department of Computer Science & Engineering**

**Assignment - III**

**Class: T.E.(CSE) – I & II Subject: TOC**

1. **Explain Model of PDA along with its methods of acceptance.**
2. **Explain Closure Properties of Context Free Languages with examples.**
3. **Construct a PDA accepting the following language by final state:**
   * 1. **L = {w Є {a,b}\* | Na(w) ≠ Nb(w) }**
     2. **L = {w Є {a,b}\* | Na(w) < Nb(w) }**

**where, Na(w) & Nb(w) are number of a’s and b’s in w respectively.**

1. **Construct a PDA accepting the following language by null store:**
   * 1. **L = { an b(n+m) am | n, m ≥ 1}**
   1. **L = { an bm c2(n+m) | n, m ≥ 1}**
   2. **L = { 0n 1m  | n, m ≥ 1 & n ≥ m}**
2. **Construct a PDA equivalent to the following CFG:**
   1. **S0 S 1| A , A1 A 0 | S | ^**
   2. **SA B | D , Aa | ^ , Bb ,**
3. **Construct a CFG which accepts the language of following PDA:**
4. **M = ( { q0, q1} , {a, b}, {a, Z0}, q0, Z0, **
5. **Where, :**

** ( q0,a, Z0q0, a Z0 **

** ( q0,a, aq0, a a**

** ( q0,b, aq1, a**

** ( q1,b, aq1, a**

** ( q1,a, aq1, **

** ( q1,, Z0q1, **

1. **Explain application of finite automata for text search with an example.**
2. **Design a DFA that recognizes the occurrences of following set of keywords:**

**“bat” and “cat”. Assume = {a, b, c, d … z}.**

**“ab”,”bc” and “ca”. Assume = {a, b, c}.**

1. 1. **Explain application of regular expressions for lexical analysis.**
   2. **Describe application of regular expressions for finding patterns in text.**
2. **Give a regular expression to describe phone numbers in all various forms.**
3. **Explain application of context-free grammar in parsing.**
4. **Explain application of context-free grammar in Document Type Definitions (DTD) in XML.**
5. **Define Turing machine (TM). Explain model of Turing machine with example.**
6. **Design Turing machine that accepts the following languages:**
   1. **The set of all strings with equal number of 0’s and 1’s.**
   2. **L = { w wR | w is any string of 0’s and 1’s }**
   3. **L = { 1n 2n 3n | n ≥ 0 }**
7. **Explain the following:**
   * + - 1. **Multi stack Turing machine**
         2. **Multi tape Turing machine**
         3. **Universal Turing machine**
8. **Describe the following:**
   * + - 1. **Recursively enumerable language**
         2. **Recursive language**
         3. **Decidable language**
         4. **Un-decidable language**

**Subject In-charge**

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