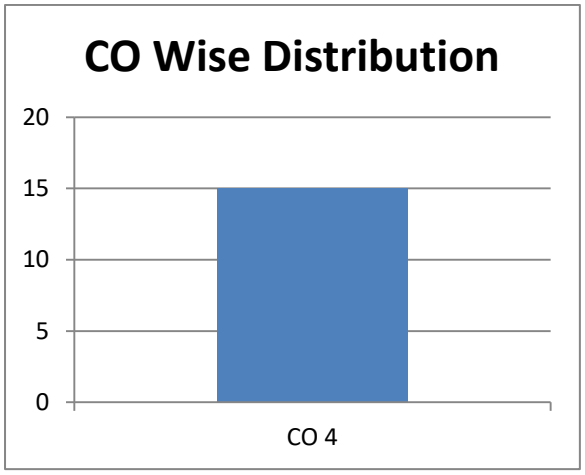
United College of Engineering & Research, Prayagraj

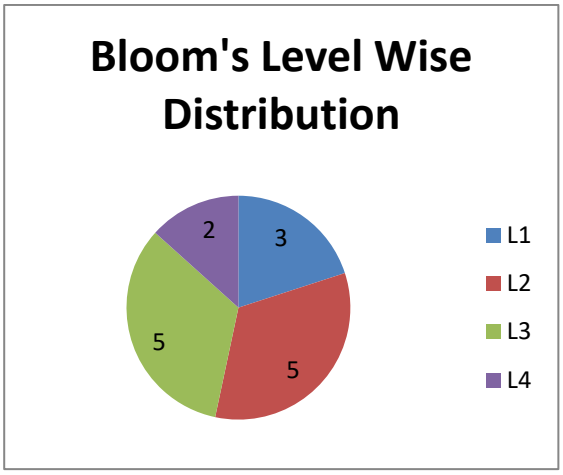
Department of Computer Science & Engineering

Automata Theory(KCS-402)

Assignment-3

Q. No.	Question	CO	Bloom's level
	Section-A		
1	Construct the CFG for the regular expression (0+1)*.	CO4	L2
2	Construct context free grammar for the language, L= { $a^n b^n$ |n ≥ 0 }.	CO4	L2
3	Explain Chomsky Normal Form and Greibach Normal Form.	CO4	L1
4	Define Reduced grammar.	CO4	L1
5	Define nullable variable and null production.	CO4	L1
	Section-B		
6	Explain in detail about the following:- (a) Closure properties of Context Free Languages. (b) Decidability-Decision properties of Regular Languages.	CO4	L2
7	Design the CFG for the following language: i) L = {0^m1^n | m ≠ n & m, n ≥ 1} ii) L = {$a^l b^m c^n$ | l + m = n & l,m ≥ 1}	CO4	L4
8	Prove that the following Language L = {$a^n b^n c^n$ } is not Context Free.	CO4	L4
9	Convert the following CFG into CNF S → XY | Xn | p X → mX | m Y → Xn | o	CO4	L3
10	Convert the following CFG into equivalent Greibach Normal Form: S→AA, A→SS, S→a, A→b	CO4	L3
11	Show that context free grammar(CFG) with productions S→a | Sa | bSS | SSb | SbS is ambiguous.	CO4	L2
12	Convert the following grammar into Chomsky Normal Form(CNF):- S→ABa, A→aab, B→Ac	CO4	L3
13	Consider the following grammar:- S→A1B, A→0A/ ε, B→0B/1B/ ε Find leftmost and rightmost derivation of strings 00101.	CO4	L2
14	Find context free grammar for the following languages with (n, m, k ≥ 0);- (a) L= {$a^n b^n c^k$! k ≥ 3} (b) L={$a^m b^n c^k$! n=m or m ≤ k }	CO4	L3
15	Given context free grammar, how do you determine that grammar as (a) Empty or Non-Empty (b) Finite or Non-Finite (c) Whether a string x belong to languages of grammar.	CO4	L3





CO - Course Outcome

Bloom's Levels

1- Remembering	2-Understanding	3-Applying
4-Analyzing	5-Evaluating	6-Creating