PDA PRACTICE SHEET

AUTOMATA & COMPUTABILITY (**CSE331**)

1. {w ∈ {0,1}*: 0^n1^n where $n \geq 0$ } ***[Spring24:B***
2. {w ∈ {0,1}*: 0^n1^m where n!=m } ***[Spring24:B]***
3. {w ∈ {0,1}*: 0^n1^{2n} where $n \geq 0$ }
4. {w ∈ {0,1}*: $0^{3n}1^{2n}$ where $n \geq 0$ }
5. {w ∈ {0,1,2}*: $0^i1^j2^k$ where $i + j = k$ }
6. {w ∈ {0,1,2}*: $0^i1^j2^k$ where $j = k + i$ }
7. {w ∈ {0,1,2,3}*: $0^i1^j2^j3^i$ }
8. {w is a palindrome} **[Summer24:A|Odd Length][Summer24:B|Even Length]**
9. {$w^1\#w^2$: not of 0's in w^1 = not of 1's in w^2 }
10. {w starts and ends with same symbols} ***[Spring24:A] [Spring23:A: Eq 10=01\|A: Eq 01=10]***
11. {w odd length and in middle 0}
12. {w ∈ {0,1,2}*: $0^i1^j2^k$ where i=j or j=k }
13. {w ∈ {0,1,2}*: $0^i1^j2^k$ where i+j≥k}
14. L^1L^2 ***, L1 → odd 0's L2 → Even 1's*** $|L^1| = |L^2|$
15. {$a^nb^mc^md^ke^kf^n$, n≥0 , m≥1 and k≥2}
16. {w ∈ {a,b,c}*: $a^mb^nc^p$ where n > m+p}
17. {w ∈ {a,b,c}*: $a^mb^nc^p$ where n > m+p, m,n,p≥1}
18. {w ∈ {a,b}*: a^mb^n where m >2n and m,n≥1}
19. {w ∈ {a,b}*: $a^nb\ a^mba^ma^n$, m,n≥1}
20. {w ∈ {0,1}*: 0^n1^n where $n \geq 2$ }
21. {w ∈ {0,1}*: 0^m1^n where $m \geq n$ }
22. {w ∈ {0,1}*: 0^m1^n where m<n }
23. {w ∈ {0,1}*: $0^n0^21^n$ } ***[Fall22]***

24. {w ∈ {x,y}*: $x^{2n}y^{n}$, n≥1}
25. {w ∈ {0,1}*: $x^{n}x^{m}y^{m}z^{n}$, n≥0}
26. {w^{1}#w^{2}: no of 00's in w^{1} = no of 11's in w^{2} }
27. {w length at least 2}
28. {w ∈ {(,)}*: w a valid parenthesis}
29. {w ∈ {0,1}*: $0^{n+2}1^{3n}$, n≥0}
30. {w ∈ {x,y}*: $x^{n}y^{n+1}$, n≥1}
31. {w ∈ {0,1}*: $0^{n}1^{n}$ where n is odd}
32. {w ∈ {0,1}*: $0^{m}1^{n}$ where $m \geq n$ *and* $m, n >= 1$ }
33. {w ∈ {0,1}*: the length of w is divisible by 4} ***[Fall22]***
34. {w ∈ {0,1}*: the number of 1's in w is multiple of 3}
35. {w ∈ {0,1}*: contains even no of 0's}
36. {w ∈ {0,1}*: the parity of 0s and 1s are different in w}
37. {w ∈ {0,1}*: the number of 0s and 1s are different in w}***[Spring24:A]***
38. {w ∈ {0,1}*: $0^{m}1^{n}$ where m,n≥1 and m>n+2 }
39. {w ∈ {0,1}*: $ww`^{R}$ : $w`^{R}$ is a reverse complement of w}[w=0100,$w`^{R}$ =1011] ***[Spring 22]***
40. **{w ∈ {0,1}*: w_1#w_2#w_3 : count function: C(w_1,0)=C(w_2,0) or C(w_2,1)=C(w_3,1)}*[Summer 24:A\|B]***
41. {w starts and ends with different symbols}***[Spring24:B]***
42. {w ∈ {0,1}*: contains at least two 1's}***[Fall23]***
43. {w ∈ {0,1}*: $1^{n}0^{n}1^{2n}$ where n≥ 0 }***[Fall23]***