1. A push down automaton is different from a finite automaton because of:
   1. a read head
   2. a memory in the form of stack
   3. a set of state
   4. all of these
2. Which of following statement is false?
   1. For a finite automaton, the working can be described in terms of change of states
   2. For a push down automata the working can be described in terms of change of instantaneous description
   3. Both a & b
   4. Neither a or b
3. For a push down automaton M = (Q,∑,Γ,δ,q0,z0,A), the set S(M) is accepted by empty stack is defined by
   1. S(M) = { sϵ ∑\*| (q0,s,Z0) ├\*( qf,Λ,Z) for some qf  ϵ A and Z ϵ Γ\*}
   2. S(M) = { sϵ ∑\*| (q0,s,Z0) ├\*( q,Λ, Λ) for some q ϵ Q }
   3. Both a & b
   4. Neither a or b
4. Which of following statement is true?
   1. A Language accepted by a PDA A by empty stack is accepted by some PDA B by final state.
   2. A Language accepted by a PDA A by final state is accepted by some PDA B by empty stack.
   3. (a) is true but (b) is false.
   4. Both (a) and (b) are true

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1. A Language over {a,b}, containing strings having equal number of a’s and b’s can be accepted by
   1. DFA
   2. NFA
   3. DPDA
   4. NPDA
2. For a push down automaton M = (Q,∑,Γ,δ,q0,z0,A),
   1. δ: mapping from Qx∑xΓ to finite subset of QxΓ
   2. δ: mapping from Qx∑xΓ\* to finite subset of QxΓ\*
   3. δ: mapping from Qx∑xΓ to finite subset of QxΓ\*
   4. δ: mapping from Qx∑ U{ Λ} xΓ to finite subset of QxΓ\*
3. Which of following is accepted by NPDA but not by a DPDA
   1. All strings in which given symbol is present at least twice
   2. Even Palindrome ( Palindrome made up of even number of symbols)
   3. String ending with particular alphabet
   4. None of above
4. Which of the following is true?
   1. PDA accepts all regular, all context free, and some non regular languages
   2. PDA accepts some regular, all context free, and some non regular languages
   3. PDA accepts all regular, all non context free, and some non regular languages
   4. PDA accepts all regular, all context free, and all non regular languages
5. Which of following statement is wrong?
   1. A regular language is also a context free language.
   2. A context free language is also a regular language.
   3. Some context free grammars are ambiguous.
   4. An ambiguous context free grammar has more than one left most derivations.
6. If a CFG is in Chomsky Normal Form, then
   1. There is restriction on the length of string on right had side of production rule.
   2. There is restriction on the type of symbols on right had side of production rule.
   3. Both (a) and (b)
   4. (a) is true but (b) is wrong.
7. Consider a CFG, S→aS|XY, X→Λ, Y→Λ, The CFG after elimination of null and useless production is
   1. S → aS | X | Y
   2. S → aS | XY | X | Y | a
   3. S → aS
   4. All of these.
8. If L(G) is the language produced by Grammar G having production rule

S → S+S | S-S | S\*S | S/S | (S) | a

Then,

* 1. a – a / a is in L(G).
  2. b –b / b is in L(G).
  3. a+(a\*a)/a – b is in L(G).
  4. both (a) and (c) is in L(G).

1. A context-free grammar S → AB | b is in
   1. Greibach Normal Form
   2. Chomsky Normal Form
   3. Both (a) and (b)
   4. Neither (a) nor (b)
2. The Language defined by the regular expression a\*bb is generated by CFG
   1. S → aSbb | Λ
   2. S → aS | bb
   3. Both (a) and (b)
   4. None of these.
3. The CFG S → aS | bS | a | b is equivalent to
   1. (a + b)+
   2. (a + b)(a + b)\*
   3. (a + b)\*(a + b)
   4. All of these
4. The set of all strings over {0,1},starting with 00 and ending in 11 is
   1. 0011
   2. 00(0+1)11
   3. (00)\*(11)\*
   4. 0\*1\*
5. The set of all strings over {a,b} in which occurrence of b’s is followed by a or occurrence of a’s followed by b is
   1. a\*b\*
   2. a\*b + b\*a
   3. a\*b
   4. b\*a
6. The set of all strings over {a,b} which has at most three a’s then
   1. No such set possible.
   2. Infinite number of such strings possible.
   3. b\* + b\*ab\* + b\*ab\*ab\* + b\*ab\*ab\*ab\*
   4. both (b) and (c)
7. The set of all strings over {0,1}, which has exactly two 1’s is
   1. 0\*10\*10\*
   2. 110\*
   3. 10\*1
   4. All of these.
8. The set of all strings over {0,1} of odd length is
   1. (0(00)\*+1(11)\*)\*
   2. (0+1)(00+01+10+11)\*
   3. 0(00+01+10+11)\*1
   4. All of these.
9. A Finite Automaton accepts a string w ϵ ∑\* if
   1. There exists a path which originates from some initial state.
   2. There exists a path which terminates on some accepting state.
   3. There exists a path which originates from some initial state, goes along the arrow and terminates at some final state.
   4. None of these.
10. The difference between DFA and NFA is
    1. Only in ∑
    2. Only in final state.
    3. Only in initial state.
    4. Only in δ function.
11. Which of following is not regular:
    1. String with odd number of 1’s
    2. String with even number of 0’s
    3. Palindromes
    4. Strings having substring 00.
12. The regular expression which has strings over { 0,1,2} in which any number of 0’s is followed by any number of 1’s followed by any number of 2’s is
    1. (0+1+2)\*
    2. 0\*1\*2\*
    3. 0\*(1+2)
    4. 0\*+1\*+2\*
13. The set of all string over {0,1} in which every 0 is immediately followed by 11 is
    1. (011)\*
    2. (011+1)\*
    3. 011(011)\*
    4. All of these.