UNIT-5

PDA-Acceptance by Final State

1. A push down automaton employs _____ data structure.
a) Queue
b) Linked List
c) Hash Table
d) Stack
Answer: d

2. State true or false:
Statement: The operations of PDA never work on elements, other than the top.
a) true
b) false
Answer: a

3. Which of the following allows stacked values to be sub-stacks rather than just finite symbols?
a) Push Down Automaton
b) Turing Machine
c) Nested Stack Automaton
d) None of the mentioned
View Answer
Answer: c

4. A non deterministic two way, nested stack automaton has n-tuple definition. State the value of n.
a) 5
b) 8
c) 4
d) 10
View Answer
Answer: d

5. Push down automata accepts _____ languages.
a) Type 3
b) Type 2
c) Type 1
d) Type 0
View Answer
Answer: b

6. The class of languages not accepted by non deterministic, nonerasing stack automata is _____
a) NSPACE(n2)

b) NL
c) CSL
d) All of the mentioned
View Answer
Answer: d

7. A push down automaton with only symbol allowed on the stack along with fixed symbol.
a) Embedded PDA
b) Nested Stack automata
c) DPDA
d) Counter Automaton
View Answer
Answer: d

8. Which of the operations are eligible in PDA?
a) Push
b) Delete
c) Insert
d) Add
View Answer
Answer: a

9. A string is accepted by a PDA when
a) Stack is not empty
b) Acceptance state
c) All of the mentioned
d) None of the mentioned
View Answer
Answer: b

10. The following move of a PDA is on the basis of:
a) Present state
b) Input Symbol
c) Present state and Input Symbol
d) None of the mentioned
View Answer
Answer: c

PDA-acceptance by Empty Stack

1. If two sets, R and T has no elements in common i.e. RÇT=Æ, then the sets are called

a) Complement
b) Union
c) Disjoint
d) Connected
View Answer
Answer: c

2. Which among the following is not a part of the Context free grammar tuple?
a) End symbol
b) Start symbol
c) Variable
d) Production
View Answer
Answer: a

3. A context free grammar is a _____
a) English grammar
b) Regular grammar
c) Context sensitive grammar
d) None of the mentioned
View Answer
Answer: c

4. The closure property of context free grammar includes :
a) Kleene
b) Concatenation
c) Union
d) All of the mentioned
View Answer
Answer: d

5. Which of the following automata takes stack as auxiliary storage?
a) Finite automata
b) Push down automata
c) Turing machine
d) All of the mentioned
View Answer
Answer: b

6. Which of the following automata takes queue as an auxiliary storage?
a) Finite automata
b) Push down automata
c) Turing machine
d) All of the mentioned
View Answer
Answer: c

7. A context free grammar can be recognized by
a) Push down automata
b) 2 way linearly bounded automata
c) Push down automata & 2 way linearly bounded automata
d) None of the mentioned
View Answer
Answer: c

8. A null production can be referred to as:
a) String
b) Symbol
c) Word
d) All of the mentioned
View Answer
Answer: a

9. The context free grammar which generates a Regular Language is termed as:
a) Context Regular Grammar
b) Regular Grammar
c) Context Sensitive Grammar
d) None of the mentioned
View Answer
Answer: b

10. NPDA stands for
a) Non-Deterministic Push Down Automata
b) Null-Push Down Automata
c) Nested Push Down Automata
d) All of the mentioned
View Answer
Answer: a

From Grammars to Push Down Automata

1. The production of the form A->B , where A and B are non terminals is called
a) Null production
b) Unit production
c) Greibach Normal Form
d) Chomsky Normal Form
View Answer
Answer: b

2. Halting states are of two types. They are:
a) Accept and Reject
b) Reject and Allow
c) Start and Reject

d) None of the mentioned
View Answer
Answer: a

3. A push down automata can be represented as:
PDA= ε-NFA +[stack] State true or false:
a) true
b) false
View Answer
Answer: a

4. A pushdown automata can be defined as: (Q, ∑, G, q0, z0, A, d)
What does the symbol z0 represents?
a) an element of G
b) initial stack symbol
c) top stack alphabet
d) all of the mentioned
View Answer
Answer: d

5. Which of the following correctly recognize the symbol '|-' in context to PDA?
a) Moves
b) transition function
c) or/not symbol
d) none of the mentioned
View Answer
Answer: a

6. Which among the following is true for the given statement?
Statement :If there are strings R and T in a language L so that R is prefix of T and R is not equivalent to T.
a) No DPDA can accept L by empty stack
b) DPDA can accept L by an empty stack
c) L is regular
d) None of the mentioned
View Answer
Answer: a

7. Which of the following can be accepted by a DPDA?
a) The set of even length palindrome over {a,b}
b) The set of odd length palindrome over {a,b}

c) {xx^c| where c stands for the complement,{0,1}}
d) None of the mentioned
View Answer
Answer: d

8. For a counter automaton, with the symbols A and Z0, the string on the stack is always in the form of _____
a) A
b) A^nZ0, n>=0
c) $Z0A^n$, n>=0
d) None of the mentioned
View Answer
Answer: b

9. State true or false:
Statement: Counter Automaton can exist for the language L={0^i1^i|i>=0}
a) true
b) false
View Answer
Answer: a

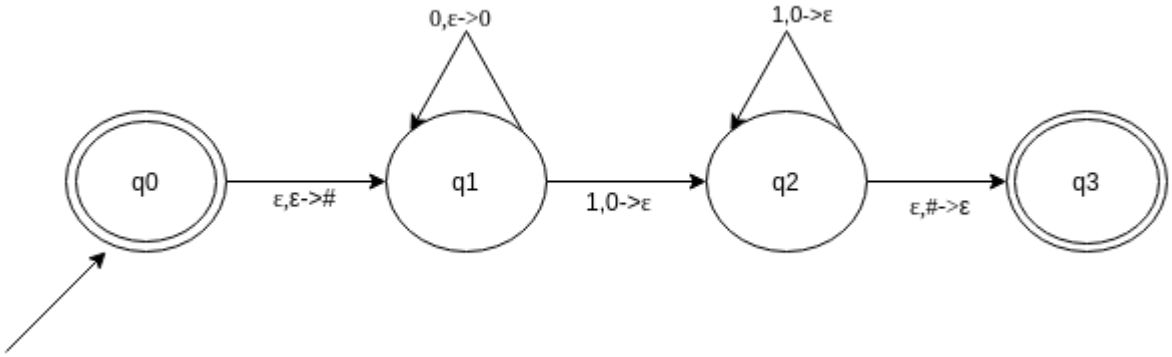
10. Let ∑={0,1}* and the grammar G be:
S->ε
S->SS
S->0S1|1S0
State which of the following is true for the given
a) Language of all and only Balanced strings
b) It contains equal number of 0's and 1's
c) Ambiguous Grammar
d) All of the mentioned
View Answer
Answer: d

From PDA to Grammars

1. The instantaneous PDA is has the following elements
a) State
b) Unconsumed input
c) Stack content
d) All of the mentioned
View Answer
Answer: d

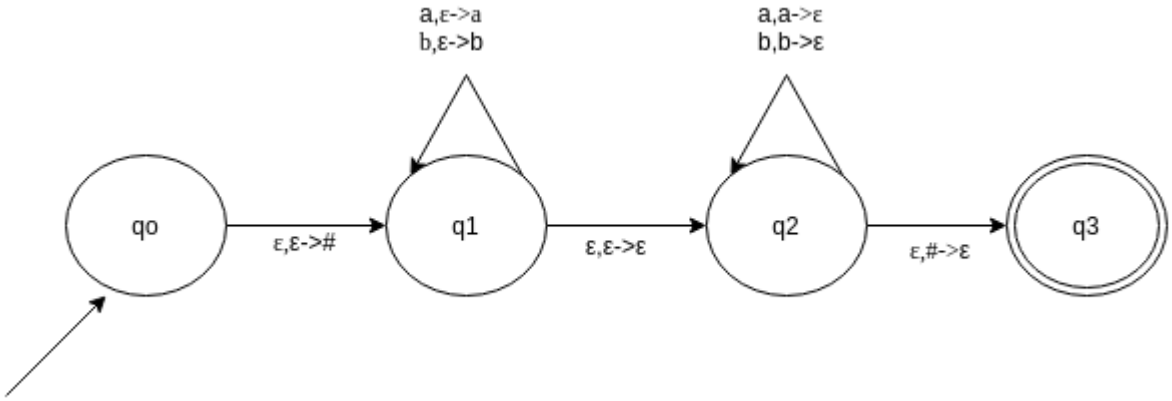
2. The moves in the PDA is technically termed as:
a) Turnstile
b) Shifter
c) Router
d) None of the mentioned
View Answer
Answer: a

3. Which of the following option resembles the given PDA?



a) $\{0^n1^n \mid n>=0\}$
b) $\{0^n1^{2n} \mid n>=0\}$
c) $\{0^{2n}1^n \mid n>=0\}$
d) None of the mentioned
View Answer
Answer: a

4. Which of the following correctly resembles the given state diagram?



a) $\{ww^r \mid w=(a+b)^*\}$
b) ε is called the initial stack symbol
c) All of the mentioned
d) None of the mentioned
View Answer
Answer: a

5. Which of the following assertion is false?
a) If L is a language accepted by PDA1 by final state, there exist a PDA2 that accepts

L by empty stack i.e. L=L(PDA1)=L(PDA2)
b) If L is a CFL then there exists a push down automata P accepting CF; by empty stack i.e. L=M(P)
c) Let L is a language accepted by PDA1 then there exist a CFG X such that L(X)=M(P)
d) All of the mentioned
View Answer
Answer: d

6. A push down automata can represented using:
a) Transition graph
b) Transition table
c) ID
d) All of the mentioned
View Answer
Answer: d

7. State true or false:
Statement: Every context free grammar can be transformed into an equvalent non deterministic push down automata.
a) true
b) false
View Answer
Answer: a

8. Which of the following statement is false?
a) For non deterministic PDA, equivalence is undecidable
b) For deterministic PDA, equivalence is decidable
c) For deterministic PDA, equivalence is undecidable
d) None of the mentioned
View Answer
Answer: c

9. Which of the following are the actions that operates on stack top?
a) Pushing
b) Popping
c) Replacing
d) All of the mentioned
View Answer
Answer: d

10. A push down automata is said to be _____ if it has atmost one transition around all configurations.
a) Finite

b) Non regular
c) Non-deterministic
d) Deterministic
View Answer
Answer: d

Deterministic PDA

1. The transition a Push down automaton makes is additionally dependent upon the:
a) stack
b) input tape
c) terminals
d) none of the mentioned
View Answer
Answer: a

2. A PDA machine configuration (p, w, y) can be correctly represented as:
a) (current state, unprocessed input, stack content)
b) (unprocessed input, stack content, current state)
c) (current state, stack content, unprocessed input)
d) none of the mentioned
View Answer
Answer: a

3. |-* is the _____ closure of |-
a) symmetric and reflexive
b) transitive and reflexive
c) symmetric and transitive
d) none of the mentioned
View Answer
Answer: b

4. With reference of a DPDA, which among the following do we perform from the start state with an empty stack?
a) process the whole string
b) end in final state
c) end with an empty stack
d) all of the mentioned
View Answer
Answer: d

5. A DPDA is a PDA in which:
a) No state p has two outgoing transitions
b) More than one state can have two or more outgoing transitions
c) Atleast one state has more than one transitions
d) None of the mentioned
View Answer
Answer: a

6. State true or false:
Statement: For every CFL, G, there exists a PDA M such that L(G) = L(M) and vice versa.
a) true
b) false
View Answer
Answer: a

7. If the PDA does not stop on an accepting state and the stack is not empty, the string is:
a) rejected
b) goes into loop forever
c) all of the mentioned
d) none of the mentioned
View Answer
Answer: a

8. A language accepted by Deterministic Push down automata is closed under which of the following?
a) Complement
b) Union
c) All of the mentioned
d) None of the mentioned
View Answer
Answer: a

9. Which of the following is a simulator for non deterministic automata?
a) JFLAP
b) Gedit
c) FAUTO
d) None of the mentioned
View Answer
Answer: a

10. Finite-state acceptors for the nested words can be:
a) nested word automata
b) push down automata
c) ndfa

d) none of the mentioned
View Answer
Answer: a

Regular Languages and D-PDA

1. Which of the following is analogous to the following?
:NFA and NPDA
a) Regular language and Context Free language
b) Regular language and Context Sensitive language
c) Context free language and Context Sensitive language
d) None of the mentioned
View Answer
Answer: a

2. Let T={p, q, r, s, t}. The number of strings in S* of length 4 such that no symbols can be repeated.
a) 120
b) 625
c) 360
d) 36
View Answer
Answer: b

3. Which of the following relates to Chomsky hierarchy?
a) Regular<CFL<CSL<Unrestricted
b) CFL<CSL<Unrestricted<Regular
c) CSL<Unrestricted<CF<Regular
d) None of the mentioned
View Answer
Answer: a

4. A language is accepted by a push down automata if it is:
a) regular
b) context free
c) regular and context free
d) none of the mentioned
View Answer
Answer: c

5. Which of the following is an incorrect regular expression identity?
a) R+f=R
b) eR=e
c) Rf=f
d) None of the mentioned
View Answer
Answer: b

6. Which of the following strings do not belong the given regular expression?
(a)*(a+cba)
a) aa
b) aaa
c) acba
d) acbacba
View Answer
Answer: d

7. Which of the following regular expression allows strings on {a,b}* with length n where n is a multiple of 4.
a) (a+b+ab+ba+aa+bb+aba+bab+abab+baba)*
b) (bbbb+aaaa)*
c) ((a+b)(a+b)(a+b)(a+b))*
d) None of the mentioned
View Answer
Answer: c

8. Which of the following strings is not generated by the given grammar:
S->SaSbS|e
a) aabb
b) abab
c) abaabb
d) None of the mentioned
View Answer
Answer: d

9. abb*c denotes which of the following?
a) {abnc|n=0}
b) {abnc|n=1}
c) {anbc|n=0}
d) {abcn|n>0}
View Answer
Answer: b

10. The following denotion belongs to which type of language:
G=(V, T, P, S)
a) Regular grammar
b) Context free grammar
c) Context Sensitive grammar
d) All of the mentioned
View Answer
Answer: b

DPDA and Context Free Languages

1. Context free grammar is called Type 2 grammar because of _____ hierarchy.
a) Greibach
b) Backus
c) Chomsky
d) None of the mentioned
View Answer
Answer: c

2. a→b
Restriction: Length of b must be atleast as much length of a.
Which of the following is correct for the given assertion?
a) Greibach Normal form
b) Context Sensitive Language
c) Chomsky Normal form
d) Recursively Ennumerable language
View Answer
Answer: b

3. From the definition of context free grammars,
G=(V, T, P, S)
What is the solution of VÇT?
a) Null
b) Not Null
c) Cannot be determined, depends on the language
d) None of the mentioned
View Answer
Answer: a

4. If P is the production, for the given statement, state true or false.
P: V->(V∑T)* represents that the left hand side production rule has no right or left context.
a) true

b) false
View Answer
Answer: a

5. There exists a Context free grammar such that:
X->aX
Which among the following is correct with respect to the given assertion?
a) Left Recursive Grammar
b) Right Recursive Grammar
c) Non Recursive Grammar
d) None of the mentioned
View Answer
Answer: b

6. If the partial derivation tree contains the root as the starting variable, the form is known as:
a) Chomsky hierarchy
b) Sentential form
c) Root form
d) None of the mentioned
View Answer
Answer: b

7. Find a regular expression for a grammar which generates a language which states :
L contains a set of strings starting wth an a and ending with a b, with something in the middle.
a) a(a*Ub*)b
b) a*(aUb)b*
c) a(a*b*)b
d) None of the mentioned
View Answer
Answer: a

8. Which of the following is the correct representation of grammar for the given regular expression?
a(aUb)*b
a)

(1) $S \rightarrow aMb$

(2) $M \rightarrow e$

(3) $M \rightarrow aM$

(4) M → bM

b)

(1) S → aMb

(2) M → Mab

(3) M → aM

(4) M → bM

c)

(1) S → aMb

(2) M → e

(3) M → aMb

(4) M → bMa

d) None of the mentioned
View Answer
Answer: a

9. A CFG consist of the following elements:
a) a set of terminal symbols
b) a set of non terminal symbols
c) a set of productions
d) all of the mentioned
View Answer
Answer: d

10. A CFG for a program describing strings of letters with the word “main” somewhere in the string:
a)

-> m a i n

-> | epsilon

-> A | B | ... | Z | a | b ... | z

b)

--> m a i n

-->

--> A | B | ... | Z | a | b ... | z

c)

--> m a i n

--> | epsilon

--> A | B | ... | Z | a | b ... | z

d) None of the mentioned
View Answer
Answer: a

DPDA and Ambiguous Grammars

1. CFGs are more powerful than:
a) DFA
b) NDFA
c) Mealy Machine
d) All of the mentioned
View Answer
Answer: d

2. State true or false:
S-> 0S1 | 01
Statement: No regular expression exists for the given grammar.
a) true
b) false
View Answer
Answer: a

3. For the given set of code, the grammar representing real numbers in Pascal has error in one of the six lines. Fetch the error.
(1) ->
(2) -> | epsilon
(3) -> | epsilon
(4) -> ‘E’ | epsilon
(5) -> + | – | epsilon
(6) -> 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
a) 3
b) 4
c) 2
d) No errors
View Answer
Answer: a

4. Which among the following is incorrect with reference to a derivation tree?
a) Every vertex has a label which is a terminal or a variable.
b) The root has a label which can be a terminal.
c) The label of the internal vertex is a variable.
d) None of the mentioned
View Answer
Answer: b

5. Let G=(V, T, P, S)
where a production can be written as:
S->aAS|a
A->SbA|ba|SS
Which of the following string is produced by the grammar?
a) aabbaab
b) aabbaa
c) baabab
d) None of the mentioned
View Answer
Answer: b

6. Statement 1: Ambiguity is the property of grammar but not the language.
Statement 2: Same language can have more than one grammar.
Which of the following options are correct with respect to the given statements?
a) Statement 1 is true but statement 2 is false
b) Statement 1 is false but statement 2 is true
c) Both the statements are true
d) Both the statements are false
View Answer
Answer: c

7. Which of the following are non essential while simplifying a grammar?
a) Removal of useless symbols
b) Removal of unit productions
c) Removal of null production
d) None of the mentioned
View Answer
Answer: d

8. Which of the following are context free language?
a) $L=\{a^ib^i|i>=0\}$
b) $L=\{ww^r|$ w is a string and r represents reverse$\}$
c) All of the mentioned
d) one of the mentioned
View Answer
Answer: a

9. The language $L =\{a^i2b^i|i>=0\}$ is:
a) recursive
b) deterministic CFL
c) regular
d) Two of the mentioned is correct
View Answer
Answer: d

10. L->rLt|tLr|t|r
The given grammar produces a language which is:
a) All palindrome
b) All even palindromes
c) All odd palindromes
d) Strings with same begin and end symbols
View Answer
Answer: c