38 Lecture - CS402

Important Mcqs

1. **What is the primary difference between deterministic pushdown automata (DPDA) and nondeterministic pushdown automata (NPDA)?**
   A. DPDA can have multiple possible transitions on the same input symbol.
   B. NPDA can have multiple possible transitions on the same input symbol.
   C. DPDA has a stack and an input tape, while NPDA only has a stack.
   D. NPDA has a stack and an input tape, while DPDA only has a stack.
   Solution: B

   Which of the following is true for an NPDA?
   A. It always accepts the input string if it has a valid path.
   B. It always rejects the input string if it has an invalid path.
   C. It may accept or reject the input string depending on the valid path.
   D. It always accepts the input string, regardless of the path.
   Solution: C

   Which of the following is a valid component of an NPDA?
   A. Input alphabet
   B. Stack alphabet
   C. Transition function
   D. All of the above
   Solution: D

   Can an NPDA have multiple start states?
   A. Yes
   B. No
   Solution: B

   Which of the following is true for an empty stack in an NPDA?
   A. It means the machine rejects the input string.
   B. It means the machine accepts the input string.
   C. It means the machine halts, but its acceptance or rejection is undefined.
   D. None of the above.
   Solution: B

   Which of the following is true for a language that can be recognized by an NPDA?
   A. It must be a regular language.
   B. It must be a context-free language.
   C. It must be a context-sensitive language.
   D. It can be any type of language.
   Solution: B

   Which of the following is not a valid operation for an NPDA?
   A. Push a symbol onto the stack

B. Pop a symbol from the stack
C. Read an input symbol
D. Write an input symbol
Solution: D

Which of the following is true for a nondeterministic choice in an NPDA?
A. It always leads to the acceptance of the input string.
B. It always leads to the rejection of the input string.
C. It may lead to the acceptance or rejection of the input string.
D. It does not affect the acceptance or rejection of the input string.
Solution: C

Which of the following is not a valid way to represent an NPDA?
A. A state transition diagram
B. A formal definition involving a 5-tuple of components
C. A context-free grammar
D. A computation tree
Solution: C

Which of the following is true for the time complexity of an NPDA?
A. It is always exponential.
B. It is always polynomial.
C. It can be either exponential or polynomial.
D. It is always constant.
Solution: C