

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