# 16 Lecture - CS402

## **Important Mcqs**

### What is the purpose of null transitions in an NFA?

- A. To consume input symbols
- B. To transition to a new state without consuming any input
- C. To reject input strings
- D. None of the above

Solution: B

#### Which of the following statements is true about null transitions in an NFA?

- A. Null transitions can be followed by any symbol
- B. Null transitions can only be followed by null symbols
- C. Null transitions are not allowed in an NFA
- D. None of the above

Solution: A

#### Which of the following is an example of an NFA with null transitions?

- A. DFA
- B. PDA
- C. Turing machine
- D. ?-NFA

Solution: D

Which of the following is a valid regular expression for the language that consists of all strings over {0, 1} that contain the substring 01?

A. 01\*

B. 10 C. (0+1)01(0+1)D. (0+1)\*Solution: C Which of the following is true about the closure under concatenation of the class of regular languages? A. The concatenation of two regular languages is always a regular language B. The concatenation of two regular languages is not necessarily a regular language C. The concatenation of two regular languages is always a context-free language D. None of the above Solution: A Which of the following is true about the closure under union of the class of regular languages? A. The union of two regular languages is always a regular language B. The union of two regular languages is not necessarily a regular language C. The union of two regular languages is always a context-free language D. None of the above Solution: A Which of the following is an example of a language that can be recognized by an NFA with null transitions but cannot be recognized by a DFA? A. {w | w contains an even number of 0's and an even number of 1's} B. {w | w contains an odd number of 0's or an odd number of 1's} C. {w | w is a palindrome} D. {w | w contains the substring 010} Solution: D

Which of the following is an example of a language that can be recognized by a DFA but cannot be recognized by an NFA with null transitions?

A. {w | w contains an even number of 0's}

- B.  $\{w \mid w \text{ contains an odd number of 1's}\}$
- C. {w | w is a palindrome}
- D. {w | w contains the substring 010}

Solution: A

#### Which of the following is true about the intersection of two regular languages?

- A. The intersection of two regular languages is always a regular language
- B. The intersection of two regular languages is not necessarily a regular language
- C. The intersection of two regular languages is always a context-free language
- D. None of the above

Solution: A

#### Which of the following is true about the complement of a regular language?

- A. The complement of a regular language is always a regular language
- B. The complement of a regular language is not necessarily a regular language
- C. The complement of a regular language is always a context-free language
- D. None of the above

Solution: A