

# 24 Lecture - CS402

## Important Mcqs

1. What is the complement of the language  $\{a, b\}$  over the alphabet  $\{a, b, c\}$ ?

- a)  $\{a, b, c\}$
- b)  $\{c\}$
- c)  $\{aa, bb, ab, ba, ac, bc, ca, cb\}$
- d)  $\{?\}$

Answer: c)  $\{aa, bb, ab, ba, ac, bc, ca, cb\}$

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

- a) It is always regular.
- b) It is never regular.
- c) It can be regular or non-regular.
- d) None of the above.

Answer: a) It is always regular.

What is the complement of the language  $\{?\}$  over the alphabet  $\{0, 1\}$ ?

- a)  $\{?\}$
- b)  $\{0, 1\}$
- c)  $\{?\}$
- d)  $\{00, 11\}$

Answer: c)  $\{?\}$

Which of the following is true about the complement of a context-free language?

- a) It is always context-free.
- b) It is never context-free.
- c) It can be context-free or non-context-free.
- d) None of the above.

Answer: c) It can be context-free or non-context-free.

What is the complement of the language  $\{a^n b^n \mid n \geq 0\}$  over the alphabet  $\{a, b\}$ ?

- a)  $\{a^n b^m \mid n \neq m\}$
- b)  $\{a^n b^m \mid n = m\}$
- c)  $\{a^m b^n \mid n \neq m\}$
- d)  $\{a^m b^n \mid n = m\}$

Answer: a)  $\{a^n b^m \mid n \neq m\}$

Which of the following is true about the complement of the empty language?

- a) It is the empty language itself.
- b) It is the universal language.
- c) It is both the empty language and the universal language.
- d) It is neither the empty language nor the universal language.

Answer: b) It is the universal language.

What is the complement of the language  $\{a^n \mid n \geq 0\}$  over the alphabet  $\{a, b\}$ ?

- a)  $\{a^n b^m \mid n \neq m\}$

b)  $\{a^n b^m \mid n = m\}$

c)  $\{b^n \mid n \geq 0\}$

d)  $\{a\}$

Answer: c)  $\{b^n \mid n \geq 0\}$

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

a) It is always a context-free language.

b) It is always a regular language.

c) It can be a context-free language or a non-context-free language.

d) It can be a regular language or a non-regular language.

Answer: d) It can be a regular language or a non-regular language.

**What is the complement of the language  $\{a^n b^n c^n \mid n \geq 0\}$  over the alphabet  $\{a, b, c\}$ ?**

a)  $\{a^n b^m c^k \mid n \geq m \text{ or } n \geq k\}$

b)  $\{a^n b^m c^k \mid n = m \text{ and } n = k\}$

c)  $\{a^n b^n c^n \mid n \geq 0\}$

d)  $\{a^n \mid n \geq 0\}$

Answer: a)  $\{a^n b^m c^k \mid n \geq m \text{ or } n \geq k\}$

**Which of the following is true about the complement of a non-regular language?**

a) It is always a regular language.

b) It is never a regular language.

c) It can be a regular language or a non-regular language.

d) None