* 1. C
  2. C
  3. B
  4. B
  5. C
  6. A
  7. C
  8. A
  9. B
  10. D

2. (bbaUaab)\*

3.1 aabb

3.2 a

4.1 (aUb)((aUb)(aUb))\*

4.2 ((aUb)(aUb)(aUb))\*(aUb)(aUbUe)

4.3 aa(aUb)\*bb

5 A picture containing indoor, table, hanging, bunch

Description automatically generated

6 suppose L= is regular, then by pumping lemma there exists some constant p such that If ||>=p, then there exist x,y,z such that , , and for any

In particular, take , then , and for any . As , we conclude or some , Hence, , contradicting the fact that L=

7.1 {ab} and are both Regular, since the i is a fixed integer (which means a finite number) I can design a finite state automata to accept both.

7.2 Regular, because {ab} is regular and , so two regular expression are regular under union operation.

For any fixed integer , is regular because since it’s fixed number I can design a finite state automata to accept it.

7.3 is not regular because when i goes to infinity, there are infinite state which can not design a finite state automata.