These brief “lessons” are designed to address common mistakes in English usage and to administer instruction in small, palatable doses.
“alternate” has two meanings

1. Something that proceeds by turns with another
2. Something that replaces another

“The axial structure consists of alternating regions where the radius of the flow, \( r(z) \), and the curvature of the magnetic field lines change from convex to concave.”

If you mean “one after the other,” use alternate
If you mean “one in place of the other,” use alternate

Alternates takes the preposition with—one thing alternates with the other.
“alternative” means a choice or option

“An alternative method to investigate nucleon resonances employs decays of charmonium states such as J/ψ and ψ(3686).”

Alternatives are usually mutually exclusive

If you mean “one or the other” or “one instead of the other,” use alternative

Some language purists insist that alternative may be used only in the case of two mutually exclusive options (one alternative or the other) [Ernest Gowers called it a fetish], but that narrow definition is not supported by most stylistic experts. It’s perfectly fine to have three or more alternatives.

But an alternative implies more than just a choice.

According to Bryan Garner, “Indeed, alternative carries with it two nuances absent from choice. First, alternative may suggest adequacy for some purpose <an alternative to driving>; and second, it may suggest compulsion to choose <the alternatives are liberty and death>.” Garner’s Modern American Usage (Oxford University Press, 2003), p. 38.

These nuances apply in some cases, not all. (After all, it’s English.)