**Step 1:** Convert the axioms to first order predicate logic.

*Note that we may or may not use quantifiers (∀, ∃) and the (letter) case doesn't matter here.*

1. company(ABC) ∧ has_employees(ABC, 500).
2. employee(x, y) ∧ company(y) ∧ earn(x, z) ∧ more(z, 250000) → pays_tax(x).
   Quantifiers are not necessary. We can also write it as:
   ∀x∀y∀z(employee(x, y) ∧ company(y) ∧ earn(x, z) ∧ more(z, 250000) → pays_tax(x)).
3. manager(Jamal, ABC).
4. manager(x, ABC) → earn(x, 500000).
5. manager(x, y) → employee(x, y). [additional axiom]
6. more(500000, 250000). [additional axiom]

In axiom 1, the fact that ABC company has 500 employees is not necessary for proving our goal. So we can ignore it.

**Step 2:** Convert the logic into Conjunctive Normal Form (CNF)

*In CNF P→Q becomes ¬P ∨Q*

1. company(ABC) [as it is, ignoring has_employees(ABC, 500)]
2. ¬ ( employee(x, y) ∧ company(y) ∧ earn(x, z) ∧ more(z, 250000)) ∨ pays_tax(x).
   ¬ employee(x) ∨ ¬ company(y) ∨ ¬ earn(x, z) ∨ ¬ more(z, 250000) ∨ pays_tax(x)
3. manager(Jamal, ABC).
4. ¬ manager(x, ABC) ∨ earn(x, 500000)
5. ¬ manager(x, y) ∨ employee(x, y).
6. more(500000, 250000). [as it is]

**Step 3:** The goal is to prove: pays_tax(Jamal).

We can prove this by contradiction. We will try to assert the negation of the goal, i.e. ¬ pays_tax(Jamal). If we fail, it will prove that our goal is true.

In each step, we match our current goal with an axiom to get rid of a part of the goal.

So in this example, in the first step we match our goal with axiom 2. So ¬ pays_tax(Jamal) gets crossed out by pays_tax(x) where we assume x is Jamal.

¬ pays_tax(Jamal)
¬ employee(Jamal, y) ∨ ¬ company(y) ∨ ¬ earn(Jamal, z) ∨ ¬ more(z, 250000) [Matching with 2]
¬ manager(Jamal, y) ∨ ¬ company(y) ∨ ¬ earn(Jamal, z)∨ ¬ more(z, 250000) [Matching with 5]
¬ company(ABC) ∨ ¬ earn(Jamal, z) ∨ ¬ more(z, 250000) [Matching with 3]
¬ earn(Jamal, z)∨ ¬ more(z, 250000) [Matching with 1]
¬ manager(Jamal, ABC) ∨ ¬ more(500000, 250000) [Matching with 4]
¬ manager(Jamal, ABC). [Matching with 6]

This contradicts with our axiom 3.

*(In step 6) we could have matched with axiom 3 [manager(Jamal, ABC)] , then it would contradict with axiom 6 [more(500000, 250000)].*

So ¬ pays_tax(Jamal) is asserted false.

Thus pays_tax(Jamal) is true.