**Logic Exercises 7: Truth-Tree Analysis**

**For each of the following, first, translate the passage into propositional logic, then using a truth-tree answer the question.**

1. Are the following two statements logically consistent?

1. Either Diego won’t go to school, or Clara will go to the park.
2. If Clara does not go to the park, then Diego will not go to school.

2. Are the following statements logically equivalent?

1. Neither Raj nor Maria will win the race.
2. It is not the case that both Raj and Maria will win the race.

3. What kind of truth-profile does each of the following statements have?

1. Tatiana won’t go to the park only if Tatiana will go to the park.
2. Nancy will join the soccer team if and only if Reba does not.

4. Is the following argument valid or invalid?

Korea will not invade Russia only if India will not go to war with Pakistan.

India will go to war with Pakistan.

So, Korea will not invade Russia.

5. Is the following argument valid?

Either government taxes will not go up or inflation will not go up.

Inflation will go up.

So, government taxes will not go up.

6. Are the following statements consistent?

1. Ariel published a book and Manny wrote a novel.
2. If Manny wrote a novel, then Ariel did publish a book.
3. Either Ariel published a book or Manny did not write a novel.

7. Is the following argument valid?

France will go to war with Italy only if India and Japan do not invade Russia.

France will not go to war with Italy.

So, Japan will invade Russia.

8. Are the following statements logically equivalent?

1. John is not tall.
2. Either John is not tall or Jane is short.

9. Is the following statement a tautology?

1. Either it is not the case that Vanessa will not go to school or Vanessa will not go to school.

10. Is the following argument valid?

Samantha will buy house only if Raj buys a car.

Raj will buy a car only if Carlos buys a motorcycle.

Carlos will not buy a motorcycle.

So, Samantha will not buy a house.