MTH 2215 Applied Discrete Math - Test #1

Spring 2021

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Directions: Show CLEARLY how you arrive at your answers!

For Exercises 1-3, Let p and q be as follows:

   p: I will take my lunch to school

   q: I get up early

1. Translate into symbolic language: "I will get up early and I will take my lunch to school."

2. Translate into symbolic language: "If I get up early, then I will take my lunch to school."

3. Translate into symbolic language: "I will take my lunch to school only if I get up early."

For Exercises 4-5, Let p and q be as follows:

p: I will celebrate.

q: I get an A.

4. Translate from symbolic language into English: $p \leftrightarrow q$

5. Translate from symbolic language into English: $\neg q \rightarrow \neg p$

6. Negate the following statement: "All cows give milk."

7. Negate the following statement: "Some elephants wear sun-glasses."

8. Negate the following statement: "No boats have wheels."

9. Negate the following statement: $\exists x \in \mathbb{R}, \ \forall y \in \mathbb{R}, \ x + y = y$

10. Negate the following statement: $\forall x \in \mathbb{R}, \ \exists y \in \mathbb{R}, \ x \cdot y = 1$

11. Give the **Converse** and the **Contrapositive** of the statement:

   "If I win the election, then I will keep all of my campaign promises."

12. Disprove the following statement by providing a counter-example:

   For all positive whole numbers n, the number $6n + 1$ is prime.

13. Create the Truth Table for the statement: $((p \wedge q) \vee \neg r) \to p$

14. Compute the bitwise AND of the two bit strings 110110 and 011010.

15. Compute the bitwise OR of the two bit strings 110110 and 011010.

16. Compute the bitwise XOR of the two bit strings 110110 and 011010.

17. Compute the output of the combination of Inverter, AND, and OR gates shown below:
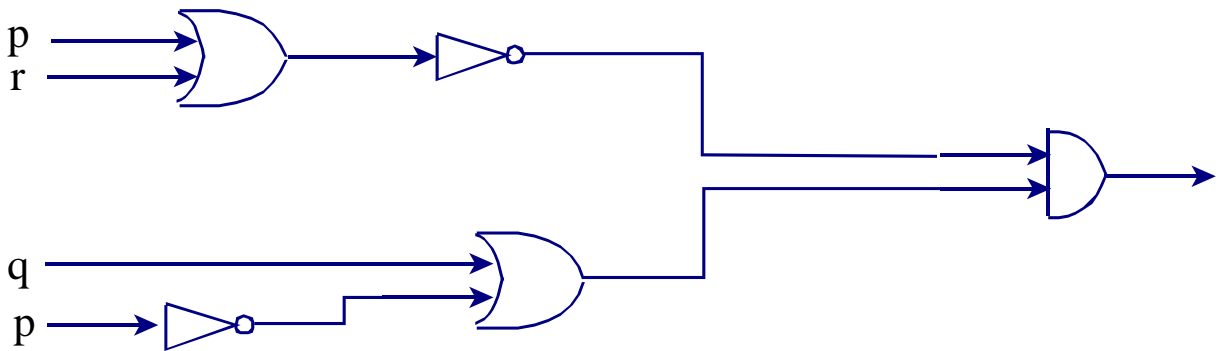
18. Determine whether the set of System Specifications is consistent:

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Access is denied if the user has not paid the subscription fee.

If the user has not entered a valid password, but has paid the subscription fee, then access is not granted.