DISCRETE MATHEMATICS
18.11.2022

1. Let p and q be the statements that are either True or False.

a) Construct a truth table for $(p \to q) \vee (q \to p)$
b) Show that $p' \vee q$ and $p \to q$ are logically equivalent.

2. Let $A = \{a, b, c\}$.

a) Find the subsets of A
b) Find the power set of A.

3. Let $f : R \to R$ and $g : R \to R$ be some real valued functions. Show that whether the following functions are linear

a) $f(x) = x^2 + 1$
b) $g(x) = -x - 1$.

4. Consider the boolean function :

$$f(a, b, c) = (a' + b)(a + b)(a' + c)(b' + c)(a' + c').$$

a) Simplify $f(a, b, c)$
b) Implement the simplified $f(a, b, c)$ by using the logic gates with two inputs

Duration : 75 Minutes