

First Question No. of Branches (3) (6/30)

State the converse, contrapositive, and inverse of each of these conditional statements.

a) If it snows today, I will ski tomorrow.

The converse:

The contrapositive:

The inverse:

b) I come to class whenever there is going to be a major 1.

The converse:

The contrapositive:

The inverse:

Second Question No. of Branches (3) (6/30)

Construct a truth table for each of these compound propositions.

a) $p \oplus \neg p$

b) $p \rightarrow \neg q$

c) $(p \oplus \neg p) \leftrightarrow (p \oplus \neg q)$

p	q	$\neg p$	$\neg q$	$p \oplus \neg p$	$p \rightarrow \neg q$	$(p \oplus \neg p) \leftrightarrow (p \rightarrow \neg q)$
T	T					
T	F					
F	T					
F	F					

Suppose that the domain of the propositional function $P(x)$ consists of the integers 1, 2, 3, 4, and 5. Express these statements without using quantifiers, instead using only negations, disjunctions, and conjunctions.

a) $\forall xP(x)$

b) $\neg\exists xP(x)$

c) $\forall x((x = 3) \rightarrow P(x)) \vee \exists x\neg P(x)$

Fourth Question No. of Branches (5) (6/30)

Let $R(x)$ be “ x is in the correct place”.

Let $E(x)$ be “ x is in excellent condition”.

Let $T(x)$ be “ x is tool”; and the domain of discourse will be every things.

Translate each of these statements into logical expressions using predicates, quantifiers, and logical connectives.

- a) Something is not in the correct place.

- b) Everything is in the correct place and in excellent condition.

- c) One of your tools is not in the correct place, but it is in excellent condition

Fifth Question No. of Branches (1) (6/30)

Show that $(p \vee q) \wedge (\neg p \vee r) \rightarrow (q \vee r)$ is a tautology

End of Questions

Good Luck