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CLASS: 5B

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① $\forall x [\exists z \text{Animal}(z) \Rightarrow \text{kills}(x, z)] \Rightarrow [\forall y \neg \text{loves}(y, x)]$

Step 1:- Eliminate \Rightarrow

$$\forall x [\neg \exists z \neg \text{Animal}(z) \vee \text{kills}(x, z)] \vee [\forall y \neg \text{loves}(y, x)]$$

Step 2: \neg Inward.

$$\forall x [\forall z \text{Animal}(z) \wedge \neg \text{kills}(x, z)] \vee [\forall y \neg \text{loves}(y, x)]$$

Step 3: change quantifiers.

$$\forall x [\forall z \text{Animal}(z) \wedge \neg \text{kills}(x, z)] \vee [\forall z \neg \text{loves}(z, x)]$$

Step 4: Skolemize.

$$\forall x [\text{Animal}(F(x)) \wedge \neg \text{kills}(x, F(x))] \vee \neg \text{loves}(G(x), x)$$

Step 5: Drop universal quantifiers.

$$[\text{Animal}(F(x)) \wedge \neg \text{kills}(x, F(x))] \vee \neg \text{loves}(G(x), x)$$

Step 6: Distribute.

$$[\text{Animal}(F(x)) \vee \neg \text{loves}(G(x), x)] \wedge [\text{Animal}(F(x)) \vee \neg \text{loves}(G(x), x)]$$

② Rules.

- cold and precipitation \rightarrow snow.

\neg cold \vee \neg precipitation \vee snow.

- January \rightarrow cold.

\neg January \vee cold.

- clouds \rightarrow precipitation

\neg clouds \vee precipitation.

Facts

- January, clouds

Prove

- snow.

Teacher's Signature : _____

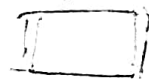
7 snow 7 cold v 7 precipitation v snow.

7 cold v 7 precipitation. 7 January v cold

7 January v 7 precipitation 7 clouds v precipitation

January 7 January v 7 clouds.

7 clouds clouds.



P. J. J. J.
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