

10-SE-28

SAMIA DEHTAQ

Cool

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Q1:-

Identify the rule of inferences in following.

(If you have a current password then you can log on the network. (you have current password.)

Therefore you can log on the network.)

Ans

this is modus ponens

$P \rightarrow Q$

$\frac{P}{\therefore Q}$

✓ ✓ ✓

Q2

using Resolution principle (direct), prove

$P \rightarrow Q \rightarrow (i)$

$P \vee \neg Q \rightarrow (ii)$

$\therefore Q$

As

$p \rightarrow q \Leftrightarrow \sim p \vee q$ so
is becomes

$$\sim p \vee q$$

solving (i) and (ii) we have

$$\begin{array}{l} p \vee q \\ \text{As } q \vee q \Leftrightarrow q \end{array} \quad \checkmark \frac{2}{2}$$

so

answer is q which
is conclusion.

Q3 Determine the validity of
following

$$p \rightarrow (q \rightarrow r)$$

$$q \rightarrow (p \rightarrow r)$$

$$\therefore (p \vee q) \rightarrow r$$

we shall use

make

truth table

p	q	$\neg r$	$q \rightarrow \neg r$	$p \rightarrow \neg r$	$p \vee q$	$p \rightarrow (q \rightarrow \neg r)$	$q \rightarrow (p \rightarrow \neg r)$	$(p \vee q) \rightarrow \neg r$
t	t	t	t	t	t	t	t	t
t	t	f	f	f	t	f	f	f
t	f	t	t	t	t	<u>t</u>	<u>t</u>	t
t	f	f	t	f	t	<u>t</u>	<u>t</u>	<u>f</u>
f	t	t	t	t	t	t	t	t
f	t	f	f	t	t	<u>t</u>	<u>t</u>	<u>f</u>
f	f	t	t	t	f	t	t	t
f	f	f	t	t	f	t	t	t

✓ 3/9 The arg is invalid - b/c
 when $p \rightarrow (q \rightarrow \neg r)$ and $q \rightarrow (p \rightarrow \neg r)$
 are true then there is case that $(p \vee q) \rightarrow \neg r$ is false

Q4 prove the following by contradiction

First we suppose
 $x \neq 1$ or $y \neq 1$
 then

$x < 1 \rightarrow (i)$ or $xy < 1 \rightarrow (ii)$
 adding (i) and (ii)

$x + y < 1 + 1$
 $x + y < 2$

which is against
 the given condition

✓
 2/2