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AQSA IQBAL

10-SE-126

### Quiz # 02

Q.1 Identify the rule of inference in the following argument - "if you have a current password, then you can <sup>log</sup> on the to the network. you have current password. therefore you can ~~log~~ on to the network."

Q no 2 Using resolution principle (direct) prove the following

$$\begin{array}{l}
 p \rightarrow q \\
 p \vee q \\
 \hline
 \therefore q
 \end{array}$$

Q no 3 Determine the validity of the following argument:

$$\begin{array}{l}
 p \rightarrow (q \rightarrow r) \\
 q \rightarrow \neg(p \rightarrow r) \\
 \hline
 (p \vee q) \rightarrow r
 \end{array}$$

Q no 4 prove by contradiction

For any real number

$$x + y \geq 2 \quad \text{then either } x \geq 1 \text{ or } y \geq 1$$

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To calculate the given we suppose  $x \geq 1$

and  $y < 1$

$$x + y < 1 + 1$$

$$x + y < 2$$

that contradicts as  $x + y$  cannot be less than

$$2 \text{ so } x + y \geq 2$$

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p	q	r	$q \rightarrow r$	$p \rightarrow r$	$p \vee q$	a		
						$p \rightarrow (q \rightarrow r)$	$q \rightarrow (p \rightarrow r)$	$(p \vee q) \rightarrow r$
T	T	T	T	T	T	T	T	T
T	T	F	F	F	T	F	F	F
T	F	T	T	F	T	T	F	T
T	F	F	T	F	T	T	T	F
F	T	T	T	T	T	T	T	T
F	T	F	F	T	T	T	T	F
F	F	T	T	T	F	T	T	T
F	F	F	T	T	F	T	T	T

Given expression is invalid as for validity both the conclusion and hypothesis should be true so in the above argument hypothesis is true but conclusion is false so expression is invalid

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2.

$$\begin{array}{l} p \rightarrow q \\ p \vee q \\ \hline \therefore q \end{array}$$

$$\begin{array}{l} p \vee q \\ \hline \bar{p} \end{array}$$

By using rule of inference

$$\begin{array}{l} p \vee q \\ \hline \therefore p \end{array} \quad (\text{Addition})$$

$$\begin{array}{l} p \rightarrow q \\ \hline \bar{p} \\ \hline \therefore q \end{array}$$

$$\bar{p} \wedge \bar{q}$$

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Q1

p : you can current password.

q : you can log onto network.

"Modus Ponens"

$$\begin{array}{l} p \rightarrow q \\ p \\ \hline \therefore q \end{array}$$

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