

COURSE : DISCRETE MATHEMATICS

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PROBLEM:

7. Express these system specifications using the propositions p "The message is scanned for viruses" and q "The message was sent from an unknown system" together with logical connectives (including negations).

- a) "The message is scanned for viruses whenever the message was sent from an unknown system."
- b) "The message was sent from an unknown system but it was not scanned for viruses."
- c) "It is necessary to scan the message for viruses whenever it was sent from an unknown system."
- d) "When a message is not sent from an unknown system it is not scanned for viruses."

ANSWER:

- a) As "whenever" is equivalent to "if," so we have $q \rightarrow p$
- b) As "but" is equivalent to "and," so we have $q \wedge \neg p$
- c) This sentence is equivalent to the sentence in "a" so we have $q \rightarrow p$
- d) As "when" is equivalent to "if" and because of Negation we have $\neg q \rightarrow \neg p$