

Implication Equivalent Forms Worksheet 1 Solutions

Question 1

The form “if P , then Q is the same as “ P is sufficient for Q . Here P is $x > 7$ and Q is $x > 3$.
The answer is **B**.

Question 2

The phrase P only if Q means $P \Rightarrow Q$. Here P is the door opens and Q is the silver key is inserted.
The answer is **A**.

Question 3

The phrase P is sufficient for Q is the same as Q is necessary for P . Here P is being a square and Q is being a rectangle.
The answer is **C**.

Question 4

The original statement is $P \Rightarrow Q$, where P is being a multiple of 30 and Q is being a multiple of 5.
Option D says Q is sufficient for P , which reverses the direction.
The answer is **D**.

Question 5

If Q is an inevitable consequence of P , then $P \Rightarrow Q$. Pressing the red button is P , and the machine beeping is Q .
The answer is **A**.

Question 6

The phrase P is sufficient for Q is equivalent to Q is necessary for P . Having two moons tattooed on its shell is necessary for being a zorple.
The answer is **C**.

Question 7

The phrase P only if Q means if P , then Q . Here P is $a = b$ and Q is $a^2 = b^2$.
The answer is **C**.

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Question 8

The phrase Q is necessary for P means $P \Rightarrow Q$. Here P is receiving the blue stamp and Q is being on List A.

The answer is **B**.

Question 9

The original statement is $P \Rightarrow Q$, where P is containing almond flour and Q is being labelled nut-containing. Option D says Q only if P , which is $Q \Rightarrow P$.

The answer is **D**.

Question 10

If Q is an inevitable consequence of P , then $P \Rightarrow Q$. Here a glim being asleep implies the shadow turns purple, so the shadow turning purple is necessary for the glim being asleep.

The answer is **A**.

Question 11

The phrase P is sufficient for Q means $P \Rightarrow Q$. Here P is $x > 10$ and Q is $x^2 > 25$.

The answer is **B**.

Question 12

The phrase if P , then Q is equivalent to Q is necessary for P . Here P is having a gold badge and Q is being allowed to enter Room 4.

The answer is **A**.

Question 13

The phrase Q is necessary for P means $P \Rightarrow Q$. Joining the trip implies the passport is valid.

The answer is **A**.

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Question 14

The original statement is $P \Rightarrow Q$, where P is being a multiple of 8 and Q is being even. Option D says P is necessary for Q , which is $Q \Rightarrow P$.

The answer is **D**.

Question 15

The phrase P only if Q means $P \Rightarrow Q$. So if the robot says BEEP, then its left antenna is raised.

The answer is **A**.

Question 16

The phrase P is sufficient for Q is equivalent to Q is necessary for P . Passing through the origin is necessary for having equation $y = mx$.

The answer is **B**.

Question 17

The phrase if P , then Q is equivalent to Q is necessary for P . Needing two labels is necessary for weighing more than 20 kg.

The answer is **A**.

Question 18

The phrase P only if Q means $P \Rightarrow Q$. Here P is divisible by 4 and Q is not odd.

The answer is **C**.

Question 19

The original statement is $P \Rightarrow Q$, where P is being made entirely from crystal and Q is reflecting blue light. Option C reverses the direction.

The answer is **C**.

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Question 20

The phrase Q is necessary for P means $P \Rightarrow Q$. Entering the lower archive implies the archive door unlocks.

The answer is **A**.

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