CS & IT ENGINEERING

Mathematical Logic

DPP 04

Discussion Notes

[MCQ]

1. Let $R(x, y, z)$ denote the statement

"$x + y = z$"

Which of the following proposition will evaluate truth value True?

(a) $R(1, 2, 3)$ ✓ (b) $R(0, 0, 1)$ (F)

(c) $R(1, 1, 2)$ (T) (d) $R(2, 3, 4)$ (F)

$R(x\ y\ z)$
$R(1\ 2\ 3)$

[MCQ]

2. Let $p(x)$, $q(x)$ denote the following open statements.

$p(x): x \leq 3$ $\quad$ $q(x): x + 1$ is odd

If the universe consists of all integers, what are the truth values of the following statements?

S_1: $\sim(p(-4) \vee q(-3))$

S_1: $\sim(p(-4) \wedge \sim q(-3))$

(a) S_1: True, S_2: False

(b) S_1: False, S_2: True

(c) S_1: True, S_2: True

(d) S_1: False, S_2: False

[NAT]

3. Let $p(x)$, $q(x)$ denote the following open statements.

$p(x): x+1>x \qquad q(x): x^2>0$

How many expressions evaluate to True?

I. $p(3) \vee [q(3) \vee \sim p(3)]$

II. $p(2) \rightarrow [q(2) \rightarrow p(2)]$

III. $[p(2) \rightarrow q(2)] \wedge p(-3)]$

[MCQ]

4. Consider the English sentence

"You can not ride the roller coaster if you are under 4 feet tall unless you are older than 16 years old".

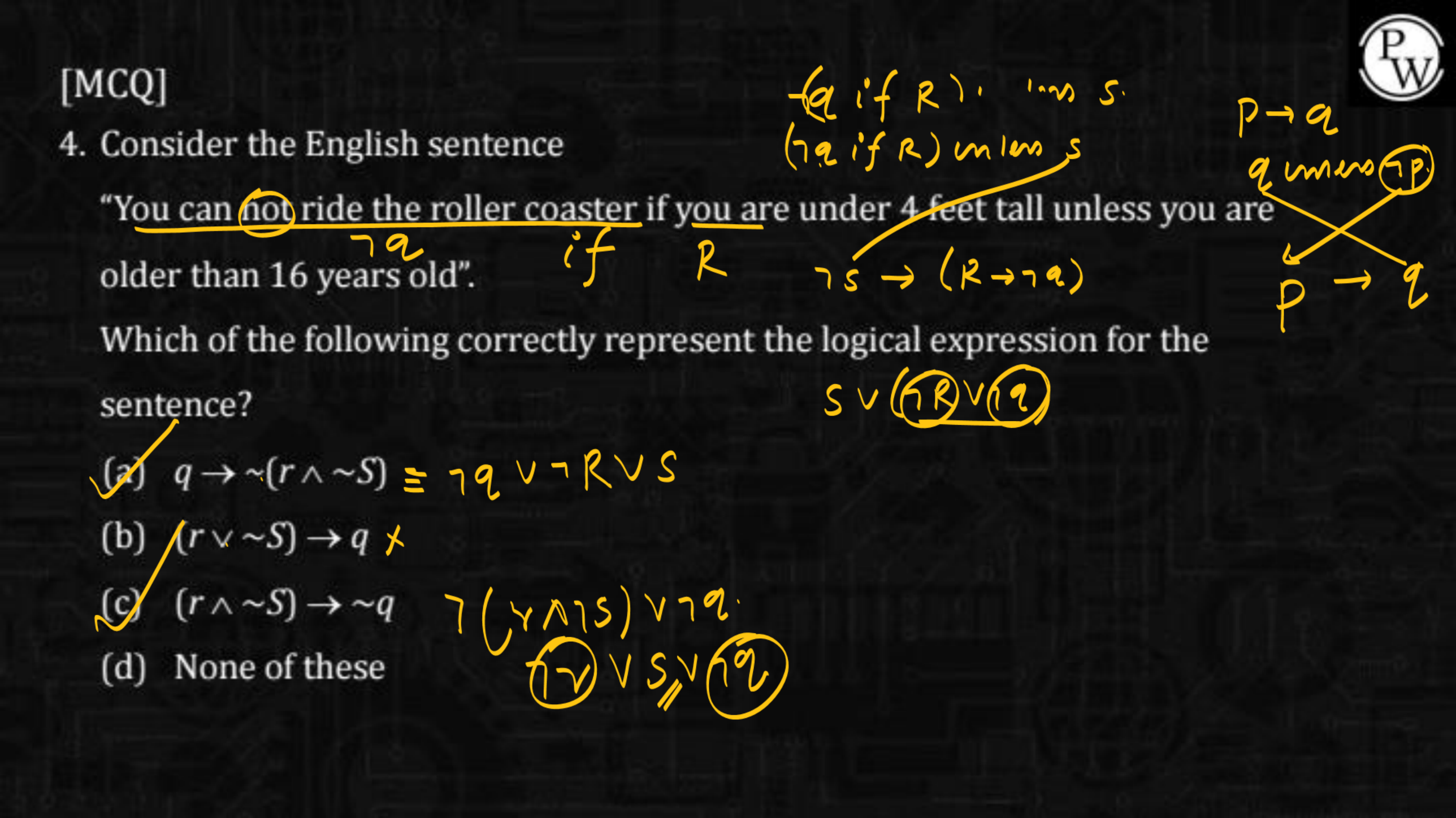
Which of the following correctly represent the logical expression for the sentence?

(a) $q \rightarrow \sim(r \wedge \sim S)$

(b) $(r \vee \sim S) \rightarrow q$

(c) $(r \wedge \sim S) \rightarrow \sim q$

(d) None of these



[MCQ]

5. Let $p(x)$ be the statement

"$x + 1 > x$"

Now, consider the truth value of quantification, where the domain consists of all real number.

$L_1 = \forall x\ p(x)$

$L_2 = \exists x\ p(x)$

Which of the following to True ?

(a) L_1 only

(b) L_2 only

(c) Both L_1 and L_2 are True

(d) Neither L_1 nor L_2


THANK YOU GW
SOLDIERS !