Question 1. [11 MARKS] EXPRESSIONS

Let $R : \mathbb{N} \to \mathbb{B}$, and define predicates $P, Q : \mathbb{N} \to \mathbb{B}$ by the following tables:

$\mathbb{N}$:	0	1	2	3	4	5	$\cdots$	165	$\cdots$	general term
P :	F	T	F	T	F	T	$\cdots$	T	$\cdots$	n is odd
Q :	T	T	F	F	F	F	$\cdots$	F	$\cdots$	$n \leq 1$

Part (a) [2 MARKS]

Fill in each blank below to make each equivalence correct. For the restricted domain on the second line, enumerate *at least* the first four natural numbers in the set, based on the definitions of P, Q above.

$$\begin{aligned} & \forall n \in \mathbb{N}, (P(n) \vee Q(n)) \Rightarrow R(n) \\ \equiv\ & \forall n \in \{\underline{\quad 0, 1, 3, 5, \ldots \quad}\}, \underline{\quad R(n) \quad} \\ \equiv\ & (\underline{\quad R(0) \quad}) \wedge (\underline{\quad R(1) \quad}) \wedge (\underline{\quad R(3) \quad}) \wedge (\underline{\quad R(5) \quad}) \wedge \ldots \end{aligned}$$