HTPI 1.1 — Quick Answer Key

Deductive Reasoning & Logical Connectives

Section A: Standard Exam

1	$(R \vee H) \wedge \neg(H \wedge T)$
2	"Either Steve or George is happy, but not both." (= Exclusive OR)
3	(a) $\neg(A \wedge B)$ (b) $\neg A \wedge \neg B$ (c) $\neg A \wedge \neg B$ → (b)≡(c), (a)≢(b)
4	If $(B \vee C)$ then $\neg K$ [full: $(B \vee C) \rightarrow \neg K$]
5	(a) T or D or both (b) exactly one of T,D (c) exactly one of T,D → (b)≡(c)
6	INVALID (counterexample: B=T, F=T, P=T, C=F)

Section B: Competition-Style 🏆

7	X = Knight, Y = Knave
8	A = truth, B = truth, C = liar (P=T, Q=T, R=F)
9	(a) $D_2 \wedge D_3$ (b) $\neg D_2 \vee \neg D_3$ (c) VALID (disjunctive syllogism)
10	VALID. $\neg R + (\neg P \vee R) \rightarrow \neg P$. $\neg P + (P \vee Q) \rightarrow Q$.
11	C is guilty. ($\neg A$ from (i)(ii) → $C \vee D$ from (iii) → C from (iv))

📖 *Detailed explanations are in the full Answer Key of the study guide.*