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Assignment Propositional logic

Q1

1) It is not the case that guy comes if Hari or Ram comes

→ G→ Guy comes
R → Ram comes
H → Hari comes

$$(G \rightarrow (H \lor R)) \land (\neg G \rightarrow \neg (H \lor R))$$

2) Hari is not only stupid but nasty too.

→ P→ Hari is stupid
Q → Hari is nasty

$$p \land q$$

3) Nobody laughed or applauded

→ P → anybody laughed
Q → anybody applauded

$$\neg (P \lor Q)$$

4) Sita & Gita are brother and sister or nephew and niece.

→ p - Sita is a brother
q - gita is a sister
r - Sita is a nephew
s - gita is a niece

$$(p \wedge q) \vee (r \wedge s)$$

Q2 p: Hari wants to come to the class
q: Hari will come to the class today
r: Hari audits the class
s: Hari is enrolled in the class.

1) $\neg p \to q$
→ Hari will come to the class today even though he doesn't want to

2) $(p \wedge \neg r \wedge s \to q) \wedge (\neg p \wedge \neg r \wedge s \to q)$

→ Hari may or may not want to come to class but he will come today not as an auditor but as enrolled in the class

3) $(s \to p \to q) \wedge (r \to p \to q)$

Hari will want to come to class today if he is enrolled in the class and wants to audit.

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Q3

1) ¬((p∨h) → g)

p	h	g	p∨h	p∨h→g	¬((p∨h)→g)
T	T	T	T	T	F
T	T	F	T	F	T
T	F	T	T	T	F
T	F	F	T	F	T
F	T	T	T	T	F
F	T	F	T	F	T
F	F	T	F	T	F
F	F	F	F	T	F

2) (¬g → (p∨h))

p	h	g	¬g	p∨h	(¬g → (p∨h))
T	T	T	F	T	T
T	T	F	T	T	T
T	F	T	F	T	T
T	F	F	T	T	T
F	T	T	F	T	T
F	T	F	T	T	T
F	F	T	F	F	T
F	F	F	T	F	F

3) $(p \to q) \lor (\neg p \to q)$

p	q	$p \to q$	$\neg p$	$\neg p \to q$	$(p \to q) \lor (\neg p \to q)$
T	T	T	F	T	T
T	F	F	F	T	T
F	T	T	T	T	T
F	F	T	T	F	T

4) $(p \to q) \to \neg(p \lor \neg q)$

p	q	$p \to q$	$\neg q$	$p \lor \neg q$	$\neg(p \lor \neg q)$	$(p \to q) \to \neg(p \lor \neg q)$
T	T	T	F	T	F	F
T	F	F	T	T	F	T
F	T	T	F	F	T	T
F	F	T	T	T	F	F

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