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Individual Assignments #58

Assignment 1.1; 2, 6, 10, 20, 28, 32, 48

Q2:

a) No
b) No
c) Yes, F
d) No
e) Yes, F
f) No

Q6:

a) The election is not decided.
b) The election is decided or the votes have been counted.
c) The election is not decided and the votes have been counted.
d) The election is decided if the votes have been counted.
e) The election is not decided if the votes have not been counted.
f) The votes have not been counted if the election is not decided.
g) The election is decided if and only if the votes have been counted.
h) The votes have not been counted or the election is decided and the votes have been counted.

Q10:

a) $r \wedge \neg q$
b) $p \wedge q \wedge r$
c) $p \rightarrow r$
d) $(p \wedge \neg q) \wedge r$
e) $(p \wedge q) \rightarrow r$
f) $r \leftrightarrow (q \vee p)$

Q20:

a) If you send me an email message then I will remember to send you the address.
b) If you were born in the United States then you are a citizen.
c) If you keep your textbook then it will be a useful reference in future courses.
d) If the Red Wings goalie plays well then they will win the Stanley Cup. (THIS IS UNTRUE!!!!! Go Canucks!)
e) If you had the best credentials then you would get the job.
f) If the beach erodes then there was a storm.
g) If you have a valid password then you can log on to the server.

h) If you reach the summit then you didn’t begin your climb too late.

Q:28

a)

p	¬p	p→ ¬p
T	F	F
F	T	T

b)

p	¬p	p ↔ ¬p
T	F	F
F	T	F

c)

p	q	p ∨ q	p ⊕ (p ∨ q)
T	T	T	F
T	F	T	F
F	T	T	T
F	F	F	F

d)

p	q	p ∧ q	p ∨ q	(p ∧ q) → (p ∨ q)
T	T	T	T	T
T	F	F	T	T
F	T	F	T	T
F	F	F	F	T

e)

p	q	¬p	q → ¬p	p ↔ q	(q → ¬p) ↔ (p ↔ q)
T	T	F	F	T	F
T	F	F	T	F	F
F	T	T	T	F	F
F	F	T	T	T	T

f)

p	q	¬q	p ↔ q	p ↔ ¬q	(p ↔ q) ⊕ (p ↔ ¬q)
T	T	F	T	F	T
T	F	T	F	T	T
F	T	F	F	T	T
F	F	T	T	F	T

Q32:

a)

p	q	r	(p ∨ q)	(p ∨ q) ∨ r
T	T	T	T	T
T	T	F	T	T
T	F	T	T	T
T	F	F	T	T
F	T	T	T	T
F	T	F	T	T
F	F	T	F	T
F	F	F	F	F

b)

p	q	r	(p ∨ q)	(p ∨ q) ∧ r
T	T	T	T	T
T	T	F	T	F
T	F	T	T	T
T	F	F	T	F
F	T	T	T	T
F	T	F	T	F
F	F	T	F	F
F	F	F	F	F

c)

p	q	r	(p ∧ q)	(p ∧ q) ∨ r
T	T	T	T	T
T	T	F	T	T
T	F	T	F	T
T	F	F	F	F
F	T	T	F	T
F	T	F	F	F
F	F	T	F	T
F	F	F	F	F

d)

p	q	r	(p ∧ q)	(p ∧ q) ∧ r
T	T	T	T	T
T	T	F	T	F
T	F	T	F	F
T	F	F	F	F
F	T	T	F	F
F	T	F	F	F
F	F	T	F	F
F	F	F	F	F

e)

p	q	r	¬r	(p ∨ q)	(p ∨ q) ∧ ¬r
T	T	T	F	T	F
T	T	F	T	T	T
T	F	T	F	T	F
T	F	F	T	T	T
F	T	T	F	T	F
F	T	F	T	T	T
F	F	T	F	F	F
F	F	F	T	F	F

f)

p	q	r	¬r	(p ∧ q)	(p ∧ q) ∨ ¬r
T	T	T	F	T	T
T	T	F	T	T	T
T	F	T	F	F	F
T	F	F	T	F	T
F	T	T	F	F	F
F	T	F	T	F	T
F	F	T	F	F	F
F	F	F	T	F	T

Q48:

a) $r \wedge \neg p$
b) $(r \wedge p) \rightarrow q$
c) $\neg r \rightarrow \neg q$
d) $(\neg p \wedge r) \rightarrow q$