Homework1

(All questions carry equal marks-10 marks each)

Exercise Set 2.1, #17, page 37

p	q	p∧q	~(p∧q)	~p	~q	~p ∧ ~q
T	T	T	F	F	F	F
T	F	F	T	F	T	F
F	T	F	T	T	F	F
F	F	F	T	T	T	T

Since the highlighted columns are not equal, the statement forms are not equivalent.

Exercise Set 2.1, #19, page 37

p	T		p∧T
T	T		T
F	T		F

Since the highlighted columns are equal, the statement forms are equivalent.

Exercise Set 2.1, #20, page 37

p	c	p∧C		p∨C
T	F	F		T
F	F	F		F

 Since the highlighted columns are not equal, the statement forms are not equivalent.

Exercise Set 2.1, #35, page 38

x > -1   AND   x≤1

Exercise Set 2.1, #42, page 38

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

The statement is a contradiction.

Exercise Set 2.2, #6, page 49

p	q	pvq	~p	~p∧q	(pvq)v(~p∧q)	(pvq)v(~p∧q)->q
T	T	T	F	F	T	T
T	F	T	F	F	T	F
F	T	T	T	T	T	T
F	F	F	T	F	F	T

Exercise Set 2.2, #11, page 49

p	q	r	q->r	(p->(q->r))	(p∧q)	(p∧q)->r	(p->(q->r))<->((p∧q)->r)
T	T	T	T	T	T	T	T
T	T	F	F	F	T	F	T
T	F	T	T	T	F	T	T
T	F	F	T	T	F	T	T
F	T	T	T	T	F	T	T
F	T	F	F	T	F	T	T
F	F	T	T	T	F	T	T
F	F	F	T	T	F	T	T

Exercise Set 2.2, #20b, page 49

Today is New Year 's Eve and tomorrow is not January

Exercise Set 2.2, #20e, page 49

x is nonnegative and x is not positive and x is not 0.

Exercise Set 2.2, #48, page 50

a). ~(p V ~q) V (r V q) ➔ (~p ∧ q) V (r V q)

b). ~(~(~p ∧ q) ∧ ~(r V q)) ➔ ~(~(~p ∧ q) ∧ (~r ∧ ~q))