Quiz 1 簡答與評分標準

1. (15pts) 5pts per question

　　算式列對即得滿分

(a) $\dfrac{9!}{2!*2!*2!*2!}$

(b) $\dfrac{8!}{2!*2!*2!*2!} * 2^2 * (-1)^2 * 3^2 * 1^2$

(c) $\dfrac{12!}{2!*2!*2!*4!*2!} * 2^2 * (-1)^2 * 3^2 * 1^4 * (-2)^2$

　　or

(a) C(9,1)*C(8,2)*C(6,2)*C(4,2)*C(2,2)

(b) C(8,2)*C(6,2)*C(4,2)*C(2,2)* $2^2 * (-1)^2 * 3^2 * 1^2$

(c) C(12,2)*C(10,2)*C(8,2)*C(6,4)*C(2,2) * $2^2 * (-1)^2 * 3^2 * 1^4 * (-2)^2$

2. (10pts) 5pts per question

(a) $C_{11}^{13} * C_{25}^{28} = 255528$

(b) $C_9^{11} * C_{25}^{28} = 180180$

3. (10pts) 5pts per question

(a) 0

(b) 2^(m-1) 若只寫出答案則只給1分

4. (10pts) 5pts per question

　　答案正確即得10分, 少考慮一個情形扣2分, 計算錯誤每個扣1分

（a）: 3
　　1. 8 個 2
　　2. 5 個 2 , 2 個 3
　　3. 2 個 2, 4 個 3
（b）: 37
　　　8! / 8! + 7! / 5!2! + 6! / 2!4!

5. (15pts) 5pts per question

答案不同, 有少括號即為0分

(a) $P \land (q \lor r) \land (\lnot P \lor \lnot q \lor r)$

$\leftrightarrow (q \lor r) \land [(P \land \lnot P) \lor (P \land \lnot q) \lor (P \land r)]$

$\leftrightarrow [(q \lor r) \land (P \land \lnot q)] \lor [(q \lor r) \land (P \land r)]$

$\leftrightarrow (\lnot q \land r \land P) \lor (r \land P)$

$\leftrightarrow r \land P$

$\lnot(r \land P) \leftrightarrow \lnot r \lor \lnot P$

(b) $P \to (\lnot q \land r) \leftrightarrow \lnot P \lor (\lnot q \land r)$

$\lnot(\lnot P \lor (\lnot q \land r)) \leftrightarrow P \land \lnot(\lnot q \land r)$

$\leftrightarrow P \land (q \lor \lnot r)$

(c) $\lnot \exists x \, [(P(x) \lor q(x)) \to r(x)] \leftrightarrow \forall x \, \lnot[\lnot(P(x) \lor q(x)) \lor r(x)]$

$\leftrightarrow \forall x \, [(P(x) \lor q(x)) \land \lnot r(x)]$

6. (5pts)

Ans: 38

1. 0個7: 4!/3! = 4

2. 1個7 + 2個3: 4!/2! = 12

3. 1個7 + 3個3: 4!/3! = 4

4. 2個7 + 1個3: 4!/2! = 12

5. 2個7 + 2個3: 4!/(2!2!) = 6

Total: 4 + 12 + 4 + 12 + 6 = 38

7. (16pts) 4pts per question

答案不正確即為0分

(a) ¬p
$\Leftrightarrow$ ¬(p ∨ p)
$\Leftrightarrow$ (p↓p)

(b) p ∨ q
$\Leftrightarrow$ ¬(p↓q)
$\Leftrightarrow$ (p↓q) ↓ (p↓q)

(c) p ∧ q
$\Leftrightarrow$ ¬(¬p ∨ ¬q)
$\Leftrightarrow$ ¬p↓¬q
$\Leftrightarrow$ (p↓p)↓(q↓q)

(d) p→q
$\Leftrightarrow$ ¬p ∨ q
$\Leftrightarrow$ ¬(¬p↓q)
$\Leftrightarrow$ (¬p↓q)↓(¬p↓q)
$\Leftrightarrow$ [(p↓p)↓q]↓[(p↓p)↓q]

8. (14pts) 7pts per question

答案不正確即為0分

(a) 13! / 2!2!2! - 12!/2!2! x 3 + 11!/2! x 3 - 10!
(b) 7! - 3! x C(7,4) = 4830