UTM

UNIVERSITI TEKNOLOGI MALAYSIA

Tutorial 1.1

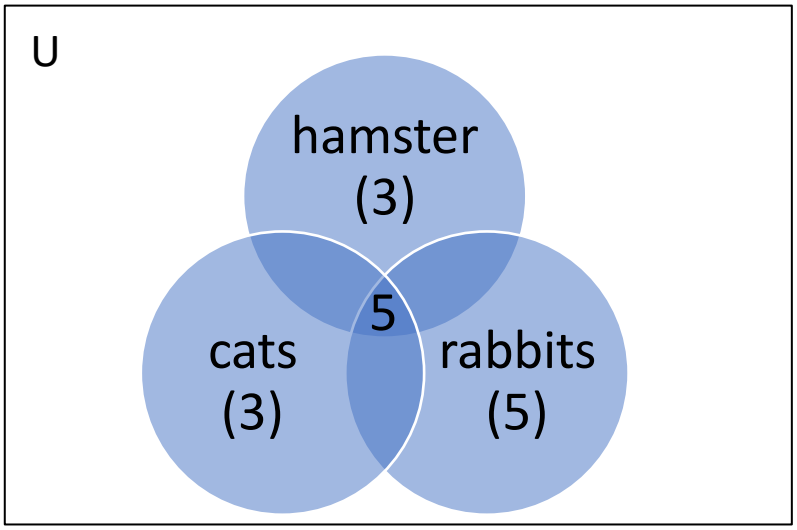
DISCRETE STRUCTURE SECI1013

Manfred John Jason Dass | A19EC5238 |

1) a. B = {2,8,18,32,50}

b. C = {1,2,3, …, 50}

2)



- 20 people own pets.
- 4 people own 2 pets.
- 5 people own 3 pets.

Total pets = 3 + 5 + 3 + (4 x 2) + (5 x 3) = **34**

3) L.H.S = $(A \cap B) \cup (A' \cup B)'$

$= (A \cap B) \cup (A'' \cap B')$

$= (A \cap B) \cup (A \cap B')$

$= A \cap (B \cup B')$

$= A \cap U$

$= A$

= R.H.S (Shown)

4) Let a and b be odd integers. Then,

$a = 2n1 + 1, b = 2n2 + 1$

$a \times b = 2n1 + 1 \times 2n2 + 1$

$= 4n1n2 + 2n1 + 2n2 + 1$

$= 2 \times 2n1n2 + n1 + n2 + 1$

$= 2m + 1$, where $m = 2n1n2 + n1 + n2$ is an integer

$\therefore$ a x b is odd

$\therefore \forall x (P(x) \rightarrow Q(x))$, for $x \in Z$ (Proven)

5) a. $r \rightarrow (q \wedge \neg p)$

p	q	r	$\neg p$	$(q \wedge \neg p)$	$r \rightarrow (q \wedge \neg p)$
0	1	1	1	1	1

b. $r \rightarrow (\neg p \wedge \neg q)$

p	q	r	$(\neg p \wedge \neg q)$	$r \rightarrow (\neg p \wedge \neg q)$
0	0	1	1	1

6) a. P(x) = x attends class on Monday

Q(x) = x attends class in the morning

$\therefore \forall x (P(x) \rightarrow Q(x))$

b. A(x)= x^2 + 2x - 3 = 0

$\therefore \exists x A(x)$

c. R(x) = x is a red flower

S(x) = x is edible

$\therefore \exists x (R(x) \rightarrow S(x))$