Answer Key

This quiz is worth a total of **100 points**.

$R \equiv$

A	B	C
7	3	5
4	1	2
2	9	8

$S \equiv$

D	B	E
2	1	5
9	3	6
8	7	8

$T \equiv$

X	Y
a	b
d	e
g	h

1. (30 points) What is $\pi_{A,B}(R \bowtie S) \times T$?

Solution:

$R \bowtie S =$

A	B	C	D	E
4	1	2	2	5
7	3	5	9	6

$\pi_{A,B}(R \bowtie S) =$

A	B
4	1
7	3

$\pi_{A,B}(R \bowtie S) \times T =$

A	B	X	Y
4	1	a	b
7	3	a	b
4	1	d	e
7	3	d	e
4	1	g	h
7	3	g	h

2. (30 points) What is $\sigma_{A<7}(R) \cup \rho_{D=A,E=C}\sigma_{D>5}(S)$?

Solution:

$\sigma_{A<7}(R) =$

A	B	C
4	1	2
2	9	8

$\sigma_{D>5}(S) =$

D	B	E
9	3	6
8	7	8

$\sigma_{A<7}(R) \cup \rho_{D=A,E=C}\sigma_{Z>5}(S) =$

A	B	C
4	1	2
2	9	8
9	3	6
8	7	8

3. (40 points) Write an expression using the relations R, S, T that has the following value.

Z	Q	W
a	b	7
a	b	1
a	b	3

Solution: A solution is $\rho_{X=Z,Y=Q,B=W}\sigma_{X=a}(T) \times \pi_B(S)$