

Question: Are the following AKE schemes secure? If not - show the attack.
 If yes - show the intuition why.

$I(a)$	$R(b)$
$x \in_{\mathbb{S}} \mathbb{Z}_q^*, X = g^x$	
\xrightarrow{X}	
	$y, c \in_{\mathbb{S}} \mathbb{Z}_q^*, Y = g^y$
$\xleftarrow{Y, c}$	
$d \in_{\mathbb{S}} \mathbb{Z}_q^*, s = x + a + c$	
$\xrightarrow{d, s}$	
	if $(g^s = XAg^c)$ then $K = H(X^y)$ $w = y + b + d$
\xleftarrow{w}	
if $(g^w = YBg^d)$ then $K = H(Y^x)$	

$I(a)$	$R(b)$
$x \in_{\mathbb{S}} \mathbb{Z}_q^*, X = g^x$	
\xrightarrow{X}	
	$y, c \in_{\mathbb{S}} \mathbb{Z}_q^*, Y = g^y$
$\xleftarrow{Y, c}$	
$d \in_{\mathbb{S}} \mathbb{Z}_q^*, s = c(x + a)$	
$\xrightarrow{d, s}$	
	if $(g^s = (AX)^c)$ then $K = H(X^y)$ $w = d(y + b)$
\xleftarrow{w}	
if $(g^w = (BY)^d)$ then $K = H(Y^x)$	

$I(a)$	$R(b)$
$x \in_{\mathbb{S}} \mathbb{Z}_q^*, X = g^{x+a}$	
\xrightarrow{X}	
	$y \in_{\mathbb{S}} \mathbb{Z}_q^*, Y = g^{y+b}$
\xleftarrow{Y}	
	$K = H(X^{y+b})$
$K = H(Y^{x+a})$	

$I(a)$	$R(b)$
$x \in_{\mathbb{S}} \mathbb{Z}_q^*, X = g^x$	
\xrightarrow{X}	
	$y \in_{\mathbb{S}} \mathbb{Z}_q^*, Y = g^y$
\xleftarrow{Y}	
	$K = H(X^y X^b A^2)$
$K = H(B^x Y^x (g^2)^a)$	