Four

2c)

		$Y=0$	$Y=1$	$Y=2$
$X_1=1$	$X_2=0$	0.08	0.18	0.03
$X_1=1$	$X_2=1$	0.64	0.03	0.12
$X_1=1$	$X_2=2$	0.16	0.03	0.09
$X_1=0$	$X_2=0$	008	0.03	0.00
$X_1=0$	$X_2=1$	0.00	0.03	0.06
$X_1=0$	$X_2=2$	0.04	0.00	0.00

Bayes error is the probability that the true value is not the most probable

So let v_c be the vector that matches Y

$v_c=(X_1, X_2)$

$$P(v_c \neq Y) = P(v_c \neq Y)$$

$$= \sum_{X_1=0}^{1} \sum_{X_2=0}^{2} P(Y=v_c) \cap (X_1 \neq x_1 \vee X_2 \neq x_2)$$

$$= (0.08+0.03+0.04+0.03+0.63+0.09+0.03+0.03)$$

$$= 0.36$$